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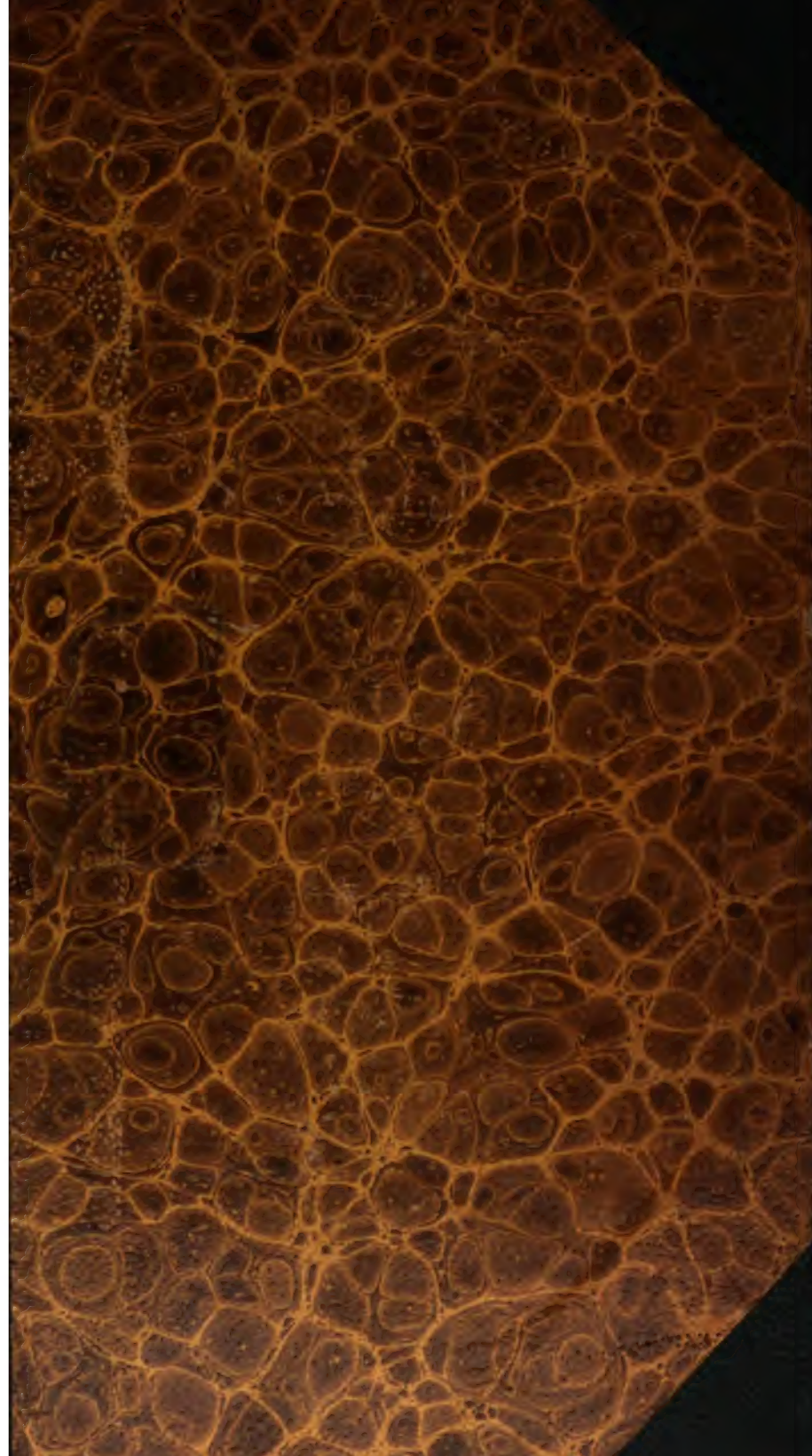
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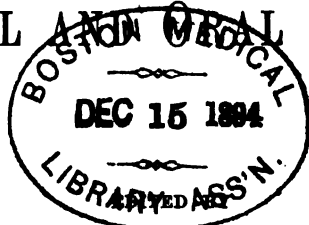


THE  
INTERNATIONAL DENTAL JOURNAL

A MONTHLY PERIODICAL

DEVOTED TO

DENTAL AND ORAL SCIENCE.



JAMES TRUMAN, D.D.S.,  
AND  
GEORGE W. WARREN, M.D., D.D.S.

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VOL. XV.

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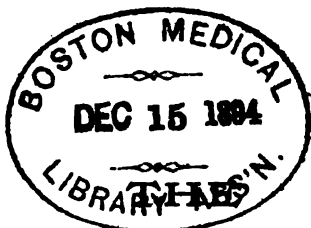
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## Original Communications.<sup>1</sup>

### ETIOLOGY OF PYORRHOEA ALVEOLARIS.<sup>2</sup>

BY C. N. PEIRCE, D.D.S.

MR. CHAIRMAN AND MEMBERS OF THE NEW YORK ODONTOLOGICAL SOCIETY,—I have no apology to offer for my presence here this evening. I come, if I understand it correctly, in response to your invitation, seconded by my interest in the subject under consideration. Your committee must, therefore, assume some of the responsibility regarding the time I shall occupy, that is, whether it shall be profitable or otherwise. The title of the short paper I shall present to you is that of the "Etiology of Pyorrhœa Alveolaris." It can certainly be truthfully stated that the profession, or such members of it who have written upon the pathology of this disease, are far from being united in their views.

In April, 1892, there was published in the INTERNATIONAL DENTAL JOURNAL an essay on this subject. If there was in that communication truth or falsehood, I shall not disown it, but shall endeavor to-night to bring further evidence to substantiate the more important statements therein contained. It appears to me that

<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

<sup>2</sup> Read before the New York Odontological Society, November 21, 1893. The publication of this paper is in advance of the discussion, which will appear in the next issue.

there is always an advantage to be gained when great obscurity of thought prevails as to the true nature of any complex morbid state, such as we witness in pyorrhœa alveolaris, to endeavor as far as possible, to reduce it to its simplest factors, and, next, to determine the primary origin of each, whether local or constitutional.

The pathological state affords the only true basis for a scientific classification of diseases. The term pyorrhœa alveolaris refers only to one symptom, and is, therefore, provisional, and more or less objectionable. As you are all aware, Dr. G. V. Black has, with some degree of appropriateness, applied to the disease under consideration the terms gingivitis or phagedenic pericementitis and calcic pericementitis. While these two terms approximate the truth, they do not, to my mind, express the whole truth. From a careful study of the abnormal pericemental or rather the alveolo-cemental membrane, it appears to me that we must recognize two closely-allied, but yet very different pathological states; different, as I shall attempt to demonstrate, in their *etiology*, in their *clinical history*, in their *symptomatology*, and in their *susceptibility to treatment*. In order the more clearly to convey my conception as to the causation, the evolution, and the differentiation of the varieties of calcic pericementitis, it has been found necessary to coin two terms, which, it is believed, will be more expressive as to their true nature, and for which you will pardon me I trust. In the first place, I believe that while pericementitis is associated with calcic deposit, the origin of the calcic salt and the antecedent condition which determines the locality and character of the deposit, as well as the train of totally distinct symptoms which follow, lead inevitably to the conclusion, that two different diseases have thus far been confounded. In one form of pericementitis the origin of the calcic salt is the saliva, and in the other form, the blood. The former I shall designate as *ptyalogenic* calcic pericementitis, expressive of the idea that in its origin it is *local*, *peripheral*, and *salivary*. The latter I shall designate as *hæmatogenic* calcic pericementitis, expressive of the idea that in its origin it is *constitutional*, *central*, and *associated* with some modification of the normal composite of the blood plasma.

I trust that when the pathological specimens with which you are familiar, and a few of which I have with me, are carefully compared, the product analyzed, and the clinical histories and symptoms of these two diseases contrasted, the appropriateness of this division and the terms employed to designate them will become apparent and reconcilable.

That hæmatogenic calcic pericementitis is an altogether distinct

affection from the preceding, and dependent for its cause upon some morbid material derived from the blood, will, I think, become apparent from the facts which I hope to adduce.

Let it be understood that by this term reference is made to the disease with which we are all familiar as *pyorrhæa alveolaris*. The symptoms of this affection are too familiar to us all to detain us more than a few moments. Let it be recalled that in this form of the disease the morbid process begins on the root, and very frequently, if not usually, in the vicinity of the apical extremity, this being in marked contrast to the pyalogenic form, which always has its origin at the gingival borders; that the inflammatory process is attended with pain, swelling, tissue disintegration, and the formation of pus; that there is a deposition of some insoluble salt upon the cementum, which, as it accumulates, eventually detaches the cemental membrane; that the alveolar process becomes absorbed; that the root of the tooth becomes horny in appearance, etc. These symptoms, taken in connection with the fact that thus far in the curative effort the disease has resisted all forms of local treatment, whether manipulative or therapeutic, it seems, would lead us inevitably to the conclusion that we have here a distinct disease of constitutional origin.

In pyalogenic pericementitis it has long been recognized that the exciting cause is the deposition of calcium phosphate and carbonate around the gingival borders, which deposition infiltrating itself into the alveolo-cemental membrane is the immediate cause of the subsequent inflammation and its concomitants. Without any apparent reason it has always been assumed that in the hæmatogenic form, the immediate cause was also the deposition of similar calcic salts. The fact, however, that in true pyorrhæa the symptoms are so different, and that all local treatment has been practically so unavailing, it has suggested the possibility that some other chemical agent derived from the blood, and the product of some morbid constitutional state, might be the exciting cause.

With the view of testing the plausibility of this assumption, I have had the deposit removed from the apical extremities of teeth which have been sacrificed by this so-called pyorrhæa, and subjected to chemical analysis. In every instance the chemical methods employed revealed the fact that the deposit was a combination of calcic urate, sodic urate, with some calcic phosphate and carbonate. The existence of the urates in which the uric acid is the predominating element shows that this deposit is a precipitate from blood exudation, and the irritation of constitutional origin, and the dis-



ease pyorrhœa alveolaris but another phase of the uric-acid or gouty diathesis. It was discovered some years ago by Dr. Garrod, an English physician, that the blood plasma of gouty patients contains an excess of uric acid amounting to 0.11 grain ( $\frac{1}{9}$  of a grain) in 1000 grains of blood plasma. Other excrementitious substances closely allied to uric acid are also present in the blood. Whatever view may be taken as to the origin of the uric acid, whether it is due to an imperfect oxidation of the food constituents, or whether it is the product of abnormal *metabolism* of protoplasmic tissue, or to faulty innervation, the fact remains, that in this diathesis there is an abnormal amount of this acid and its salts in the blood. Owing to the non-diffusibility of uric acid, it is but imperfectly eliminated from the blood by the kidneys. Accumulating in consequence, it enters into combination with sodium and calcium, forming urates. When the amount of uric-acid salts attains a certain percentage they are eliminated from the blood through the walls of the capillary blood-vessels, passing out associated with the lymph. The tissues which become the seat of this salt-exudation are pre-eminently the connective tissues; those tissues presenting the greatest degree of density and the least degree of vascularity. Hence the tissues forming joints become the primary seats of the uric acid deposits. It must, however, be remembered that all tissues, or rather the same tissues in all parts of the body may be thus affected.

The salts found in the exudation of gouty subjects are usually urates of lime, soda, and, to some extent, the phosphate and carbonate of lime. After the fluid has been exuded from the vessels, the non-appropriated lymph is absorbed by the lymphatics, and the salts left behind are deposited in both the amorphous and crystalline forms. The presence of the salts, acting as foreign bodies, excite the ordinary phenomena of inflammation.

Let us now apply these facts to the disease in question,—viz., pyorrhœa alveolaris. Inasmuch as all portions of the body have been shown by pathologists to be liable to uric acid deposits, it is not at all strange that the alveolo-cemental membrane, composed largely of connective tissue, should also become a depot for uric-acid deposits. It is more than probable that as a predisposing cause there might co-exist some impairment in the nutrition of this membrane dependent upon either local mechanical force, or some obscure faulty innervation.<sup>1</sup> However this may be, the mere presence of these salts leads to the conclusion that here as elsewhere they

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<sup>1</sup> Wedging, malleting, etc.

are derived from the blood by or through the medium of the lymph stream. With the absorption of the excess of lymph, the residual salts become precipitated upon the cemental surface.

It is for this reason that I regard the deposition of uric acid as of blood origin and the disease pyorrhœa alveolaris as one of the local manifestations of the constitutional state familiar to all pathologists as the uric-acid or gouty diathesis. Assuming now that the deposition of uric-acid salts is the primary cause of this form of pericementitis, what would naturally be the successive stages in its evolution?

As the current of the lymph-stream is directed for the most part towards the cementum, through its borders or periphery into the lacunæ and canaliculi, and finally in the reverse direction, it is not difficult to see why the deposit should take place on the surface of the cementum as well as in the meshes of the alveolo-cemental membrane. The constant deposition and pressure of these insoluble salts will act as irritants engendering the well-known inflammatory states,—viz., congestion, exudation, impaired nutrition, tissue disorganization, and the formation of pus. These changes taking place here as elsewhere in the immediate vicinity of the irritation—that is, on the cemental aspect of the membrane—leads to its detachment from the cementum and the development of a pus-pocket.

As the disease is progressive, extending through a series of years, it might be expected that the deposition of these uric-acid salts would attain a greater volume than is generally found on most affected teeth; but it must be remembered that, although these salts are insoluble, as long as fluid in the form of pus is present, their crystallization and constant accumulative deposition is largely prevented by being carried away by the pus-stream which flows through the pocket or sinus to the gum margins. An examination of this pus has not yet been effected, but there is little doubt, when it is, that it will demonstrate the presence of the urates. Now, how will this interpretation of the pathology of pyorrhœa alveolaris account for that other symptom which is so characteristic a feature,—viz., disappearance of the alveolar process. The key to the mechanism of alveolar absorption is furnished by the pathology of bone-softening in general. If the periosteum of any bone becomes the seat of inflammation, an exudation is poured out from its inner surface, which is in close contact with the compact tissue. This exudation exerts pressure on the bone, interferes with its nutrition, and, in consequence, leads to softening

and absorption. If the tension be not relieved by the removal of the exudation, the softening increases and necrosis results, but if the pressure be removed in sufficient time, the progressive pathological state never passes beyond the stage of softening and absorption.

In pericementitis the effusion exerts a pressure in both directions,—towards the cementum and towards the alveolar process. The constant pressure of the exudation would, by interference with the nutrition of the process, lead not only to softening and absorption, but to necrosis also, if it were not that as the pus accumulates and the pressure rises the fluid takes the line of the least resistance and burrows towards the gum margins, and so relieves the pressure on the alveolar process before complete strangulation of the tissues takes place; but as the pressure from pus accumulation rises and falls, from time to time, there will be periodical compressions with some pain and gradual absorption. If necrosis of the process should, however, occur in any appreciable amount, we should have it demonstrated by exfoliation and sequestration.

The pus, to which allusion has already been made, is doubtless effected through the influence of the micro-organisms upon the exudation. In the multiplication of these bacteria they increase the disintegration of tissues and so contribute to the establishment of this pus-containing cavity or pocket,—an abscess, from which, without treatment, pus is continually discharged until the surrounding tissues are destroyed and the tooth either drops out or, to relieve discomfort, is artificially removed. The staphylococcus, which is supposed to be the bacterial form present, is not considered pathogenic, though experiments made by Dr. G. V. Black led him to believe that it was not a passive or harmless concomitant of this purulent inflammatory process.

I have had three specimens of this tooth-deposit examined chemically by Professor Ernest Congdon, of the Drexel Institute, whose experimental skill is a sufficient guarantee for the accuracy of the results obtained.

The tests which were employed were: 1, the hydrochloric acid test; 2, the dry or the destructive distillation test; 3, the murexide test. The value of the hydrochloric-acid test depends upon the fact that the acid has the power of breaking up the compounds of uric acid and separating crystals of uric acid.

After the removal from the root of the tooth the deposit was placed in a watch-glass and mixed with a few drops of distilled water; to this several drops of commercially pure hydrochloric acid were

added and the glass placed over the sand-bath of a micro-chemical burner and subjected to a moderate heat for some time, or until the solution had evaporated to dryness, when the residue was examined microscopically.

The dry or destructive distillation test depends for its value upon the development of ammonia. The molecular composition of uric acid is  $C_5H_4N_4O_6$ . When this acid or any of its salts is decomposed by heat, the atoms are disassociated and ammonia gas,  $NH_3$ , a strongly alkaline compound, is set free. A few grains of this deposit being placed in the end of a test-tube and a highly sensitive red litmus-paper moistened with distilled water and placed in the open end and then subjected to heat, the resulting ammonia gas ascends and in a few minutes colors the litmus-paper deep blue. As no other alkali is volatile, this is regarded as an extremely delicate test for ammonia, and as this can only come from a nitrogen-holding compound,—as urea, uric acid, or an allied compound,—the conclusion is inevitable that we have had present in the test-tube one of the just-mentioned compounds.

The murexide test is the usual one for uric acid and its salts. The deposit, being placed in a watch-glass or porcelain cup, is treated to a few drops of strong nitric acid; decomposition at once takes place, and a yellow color is produced. Nitrogen and carbon dioxide gases are given off; urea and alloxan remain behind. The solution being slowly evaporated, the residue is allowed to cool; upon the addition of a few drops of dilute ammonia, if uric acid is present, a purplish-red color—"murexide"—is at once produced. Three specimens were examined by Professor Congdon by these three tests, and the following results were reported to me by him:

Specimen No. 1 contained, as shown by microscopical analysis, a number of fine needle-crystals of calcium urate, a few crystals of free uric acid, and crystals of calcium phosphate. Destructive distillation analysis yielded a strong ammonia reaction. The murexide test for uric acid and its compounds was faint, though the characteristic color showed in several places.

Specimen No. 2 presented the same crystals on microscopical investigation. The murexide test was strong, producing a number of purplish-red spots.

Specimen No. 3 yielded similar results.

In addition to these three analyses by Professor Congdon, some six or eight specimens were examined by my friend and colleague Professor A. P. Brubaker, M.D., D.D.S., in my library and in my presence, the results obtained corresponding to those of Professor

Congdon. In three of these an abundance of urate of soda crystals were observed. It must be remembered that, as the quantity embraced in each specimen was small in amount, large results could scarcely be obtained or expected.

The treatment of the constitutional state, of which the pericementitis is but a local expression, resolves itself into,—1, the prevention of the uric-acid formation; 2, the relief of the lesions occasioned by its depositions. Uric acid, we are led to believe, is one of the many products which result from the destructive and imperfect metabolism of nitrogenized food. When all foods are completely oxidized in the body, the ultimate compounds are carbon dioxide, urea, and water. Large consumption of foods, over-indulgence in alcoholic and malt liquors, insufficient exercise, form a combination of causes which prevent complete oxidation of foods and encourage the development of numerous side products, among which are uric acid and its salts. Among foods it has been thought that the nitrogenized were the chief sources of uric acid, and, while this is undoubtedly the case, it is also a well-known fact that the saccharine and starchy foods, by occasioning gastric and intestinal derangement, are in all probability the remote causes of the subsequent imperfect digestion of the albuminous foods. As far as dietetic treatment is concerned, the regular practitioner feels that in treating uric-acid disorders attention must be paid to the existing digestive condition, to the regulation of diet, to the oxidation and elimination of waste products, by out-door exercise, by the drinking of hot water, by the use of alkaline and saline waters, such as Apollinaris, Hunyadi, Marienbad, Buffalo Lithia, etc. The administration of alkalies and iron, agents which improve the digestion and promote oxidation, have also proved of benefit. It must be remembered, however, that this constitutional vice is not established suddenly, but is frequently a result of inheritance, or, if acquired, it is through years of over-indulgence in eating or drinking. In consequence of this, it will be eradicated but slowly or controlled with difficulty. From time to time exacerbations in the progress of the general constitutional disorder will lead to an exaltation in the local manifestations. At such times the rapid elimination of the uric-acid compounds must be the primary consideration. For this purpose agents which act as solvents of uric acid must be employed; those which the general medical practitioner has found of greatest service are the citrate of lithium and carbonate of potassium. The persistent use of these alkalies it is contended will gradually oxidize the uric acid to the stage of urea or an easily diffusible urate, after

which it is easily eliminated by the kidneys. Colchicum has also enjoyed much popularity for many years as an eliminating agent acting on both kidneys and bowels.

The physician maintains that regular and systematic treatment must be established if the constitutional uric-acid diathesis is to be overcome. Now, if it be true, as I have intimated and am inclined to believe, that it is the presence of this uric-acid diathesis which predisposes to, and in many cases gives origin to, the local hæmatogenic calcic pericementitis, the sooner we as practising dentists recognize this fact and modify our treatment to the existing conditions, the more efficiently will we serve our patients.

In presenting this paper with the statements embraced therein, which I have endeavored to demonstrate, I hope it will open a broader field for investigation, which will, in the near future or eventually, lead to a more intelligent and united judgment upon the etiology of pyorrhœa alveolaris, which certainly at the present time is so unsatisfactory.

I cannot close this short address without again expressing my great obligation to my friend and colleague Professor Albert P. Brubaker, M.D., D.D.S., who has not only carefully repeated in my presence the analysis and experiments of Professor Congdon, with the addition of a number of others, but has most cheerfully furnished me with the pathology and therapeutics of uric-acid treatment, making that part of the paper thoroughly consistent with the recognized theories of to-day.

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## THE ADVANTAGES AND DISADVANTAGES OF SPECIALISM.<sup>1</sup>

BY REUEN THOMAS, D.D. PH.D., BROOKLINE, MASS.

MR. PRESIDENT AND GENTLEMEN,—Ever since I accepted your invitation to be present at this meeting I have been in a state of constant wonderment at my own audacity. I have no kind of experience or ability which would qualify me to speak on dentistry. The moment I began to do that my position would be not dissimilar to that of the clown in the circus. If you have invited me here

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<sup>1</sup> An address delivered before the American Academy of Dental Science at its annual meeting, Boston, November 15, 1898.

with the idea of aiding your digestion by increasing your laughter, I am afraid you will fail of your purpose, for I do not intend to speak on dentistry. So long as I do not commit myself to speech on that painful theme, I may get credit for knowing something about it. The probability that some of the learned gentlemen here present would not be able to follow me if I should venture upon the scientific treatment of the theme is one of the reasons why I forbear. When I tell you that my definition of a tooth would be about like this: "A tooth is a structure in which a process of the epiblastic layer—the buccal epithelium—grows into the subjacent dermis, and, assuming a cup-like form (with the concavity of the cup turned away from the epithelial surface of the mouth), a dermal papilla rises into the cup;" that the definition of a tooth would be something like that, and that the whole of the address would be consistent, both in language and lucidity, with this definition, I have no doubt of your congratulating yourselves that no such process stretches before your vision.

Modestly discarding all idea of mystifying this learned body by an essay on dentistry too scientific for general comprehension, I asked myself whether it might not be expected that I should speak, as one might say, anthropologically, and treat men as if they were teeth. Under that idea some men would be regarded as incisors, some as molars, some as sound, and some as decayed. Under these headings we might possibly make a new and accurate division of the human race. These and other dental suggestions would lead us to such inferences as these: that there are some men we could do without and be all the happier; that as false teeth have sometimes a more pearly and regular appearance than true teeth, so also false men are sometimes even better looking outwardly than true men, and that Iago and Mephistopheles in all probability were most fascinating gentlemen. Along that line of remark we might find much that was interesting and profitable.

It seemed highly probable that you might want to know something of the relation of dentistry to theology. But the more I mused on that theme the more difficult it seemed to make the connection. That there is such a connection I have no manner of doubt. But the immediateness of the relation is not easy to discover. Jacob's ladder had its foot on the earth and its top seemingly in the heavens. Between the lowest and the highest round of that ladder there was a connection, and so, I suppose it is true that everything is connected with everything else. We know that teeth have a very important relation to food, and that food has a very



close relation to digestion, and that digestion may become indigestion, and that under an attack of indigestion a clergyman might proclaim a very dark-hued and Satanic theology, and un pityingly and remorselessly send all his hearers into the Inferno so vividly imagined by Dante. So that there can be no doubt that dentistry has a relation to theology, and bad teeth may account for much bad theology, as also for the bad delivery of good theology. No one can question that there is a very manifest association between dentistry and speech. An indistinct and unintelligible utterance will spoil the effect of the most thoughtful speech, or the most intelligent sermon. The responsibility of dentists for much bad theology and poor preaching may therefore be greater than even the most thoughtful members of the profession have ever in their most serious moments assumed to be the case. If only it were possible to make a dentist's chair easy and attractive, so that it did not associate itself with pain, the most timid and nervous men and women would seek it as a matter of course, the men to be made useful and the women to be made beautiful forever. I do not mean to suggest that the speech of the woman part of mankind is not sufficiently distinct and emphatic as it is. But man is a speaking animal as well as an eating animal, and a skilful, scientific, humane dentist may be of as much service to all men whose profession involves public speech as is the first-class professor of elocution. For the ability which a tooth has of punishing or serving its owner is among the things that are remarkable. A tooth can be as annoying as an Irish Bridget, as ingenious in inflicting pain as a Mediæval Inquisitor, or as serviceable to its master as Caleb Balderston in Scott's "Bride of Lammermoor."

But leaving all this preliminary skirmishing, confronted as I am with gentlemen who are specialists, I wish to offer a few thoughts on "Specialism: its advantages and its dangers." Dentistry has attained to the dignity of a profession. By and by a volume will be published, I do not doubt, entitled "Great Dentists," as now we have volumes on "Great Surgeons," "Great Lawyers," "Great Divines." But the time has not yet come for such a volume, as the profession is comparatively new. As a writer in the "Encyclopædia Britannica" puts it, "For long, dentistry was practised to a large extent as a superadded means of livelihood by persons engaged in some other pursuit, and without any professional education whatever. The blacksmith, the barber, the watchmaker, and others of the same class were the dentists of every village and country town; while even in some of our larger cities dentists of the kind were till

lately to be found practising under the very shadow of our universities and public schools." These words refer primarily to England, but they sufficiently well fit the past condition of things on this side of the ocean, if the speech of the men of seventy years and upward is to be taken as reliable. In our days it is not considered so respectable for a man to be a general practitioner as it is to be a specialist. The time has gone by when one and the same man taught classics and mathematics. The professor of Latin seldom ventures nowadays in any but a third-class academy or school to be also the professor of Greek. Every man has to be more or less of a specialist. The definition of a learned man or a scholarly man in our day has changed from what it was in the days of our grandfathers. Then a learned man was a man who professed to know all that was knowable of most everything. He was a walking encyclopædia, or, as was said of Macaulay, "a book in breeches." Now the encyclopædic man is generally regarded as a charlatan. A learned man in our day is a man who knows everything of something and something of everything. Some of his knowledge must be microscopic, but most of this knowledge telescopic. He is minutely acquainted with some one thing and generally acquainted with many things.

I assume that the gentlemen here present know everything that is to be known about teeth. And yet I doubt it. In order to know everything that is knowable about teeth, is it not necessary that all and everything which is preliminary to the growth of a tooth should be known? It is certain that teeth are associated with the whole animal organism, and that the whole of the organism contributes to them, so much so that the reason why you and I have the teeth that characterize us is not satisfactorily accounted for by simply examining the teeth. At the back of the teeth is the blood in the veins, and at the back of that one knows not how many rogues and rascals in our ancestry until we get back (as one gentleman I talked with the other day assured me he did) to William the Conqueror.

In order to give a full and particular account of anything belonging to any individual man, it is necessary to know vastly more than is revealed in the man's own individuality. A certain English nobleman, recently deceased, was what is called a kleptomaniac. He had everything that heart could wish, much more of wealth than any sane or insane man could legitimately use, and yet if he were left by himself for a while he would be like that politician who the first time he found himself in Washington, contrary to all his

former propensities, had an overmastering desire to steal something. So this English nobleman, richer in money than Cræsus himself, had in his blood the persistent tendency to steal. How had it got there? Had it no relation to the fact that in days long ago his ancestors used to go on foraging expeditions and drive off the cattle of their weaker neighbors?

Now, if a learned man is a man who knows everything about some one thing, a learned dentist should be a dentist who knows everything that is knowable about teeth. But in order to do this he must know something about anatomy and physiology, and much else besides. For anatomy and physiology are associated with psychology and mental philosophy generally. The influence of mind on matter is only beginning to be appreciated. We are on the edge of a realm of knowledge which is as certainly hidden from us now, or revealed to us only suggestively—as much hidden as was the realm of the infinitely little before the invention of the microscope, or the realm of the infinitely great before the invention of the telescope.

Now, the tendency of specialism is to take the telescope out of a man's hand and leave him only with a microscope. The tendency is to imprison him within the limit of his specialism—to bring his mind under the power of the ideas and laws of that specialty which he is constantly studying. The mind of the specialist has a tendency to conform to the thing about which it is persistently and continuously occupied, to take its tone, its color, its mode of vision, the way in which it looks at things from the particular region to which it bends its attention with most interest and with daily recurring constancy. The mathematician gradually loses all power of estimating the value of anything which cannot be mathematically proved. Unless by studies not mathematical he keeps his mind fresh and free, some of the most fascinating departments of knowledge will gradually lose their influence over him and he will be as mentally enslaved as the man who, looking at a most suggestive work of art full of life and expression, could make no remark but one. The size of the canvas led him to exclaim, "I wonder how many pounds of paint it took to produce that thing?" So, also, the biologist, the geologist, and other ologists, confining themselves to their specialty, gradually get their minds trained down to the conditions under which they are daily working, and come into an ability of appreciating only one kind of evidence. Illustrations of this abound. There was never a more convincing instance of the way in which the mind of a very eminent and distinguished man comes

to settle into the mould of its specialty than when some years since Professor Tyndall asked of certain London divines that the question whether God answered prayer should be submitted to a practical test suggested by himself. The test was that the London Hospital should be divided into two sections. The church should offer up its prayer for the sick on behalf of the people in the wards on one side of the hospital, and not those on the other side. The result of the experiment should decide the question. Now, it is scarcely credible that such a suggestion, from the mind of such a man, could have been made seriously. Both God and all good praying people must have accepted as reasonable and intelligent Professor Tyndall's suggestion before it could have been made. To begin with, Tyndall's idea of prayer was not Christian. It was so ignorant an idea of what prayer is that a well-instructed Sunday-school child would see the defect in it. That Tyndall was serious there can be no doubt. The fact shows one of the dangers of our nineteenth century specialism, and how it reduces the minds of even superior men to the level of the particular branch of science in which they are constantly working, as the dyer's hand takes the color of the dye in which he puts it. That is why in that wonderful "Journal of Amiel," next to the thoughts of Pascal one of the most suggestive books of its kind ever issued, the writer says, "Science does not make men, but only entities and abstractions." Scientific men are so given to analysis that many of them live in a dissecting-room for the period of their natural life. We may analyze a rose till we have no rose. We may dissect a human body till we have no body. Too much concentration tends to fix the mind on parts to the neglect of the whole. That every part suggests a whole, and needs a whole to explain it, is a fact of which we must never lose sight. That is what Tennyson is trying to say when he plucks the little flower out of the crannied wall:

"Flower in the crannied wall,  
I pluck you out of the crannies;  
Hold you here, root and all in my hand,  
Little flower, but if I could understand  
What you are, root and all, and all in all,  
I should know what God and man is."

Specialism has, then, the advantage of giving a minute knowledge of some one part of the human organism, or of some confined region of science. The man who gives exclusive attention to the eye eventually arrives at a knowledge of all abnormal conditions

to which that organ is liable, gets to discern every symptom and sign of disease, and to acquire all the scientific knowledge and skill which up to date belongs to his particular specialty. So with the ear, so with the throat, so with the brain,—a much more complicated specialty than the others I have named. So with every other organ and region of the body. And these specialists are the men to consult if you can afford to pay them their high fees, and if you are intent on commanding the best assistance which science can offer. Specialism is a distinct advance upon generalism. Not one word other than a word of gratitude to that Providence which is always moving the race onward towards something higher and better have we to offer in regard to it. Its helpfulness is often wonderful, its advantages are beyond question. So far as the general public is concerned, specialism is an immense gain.

But I am thinking of the effect of specialism on the specialists themselves. The question whether we are not in our generation growing a large crop of men who are learnedly narrow, and that because they are confined to too microscopic work, to research into detail rather than to research on the broad continents of knowledge, is a question which cannot be waved aside as if it were not worth the asking. There are laws of mind which are unalterable. The mind conforms itself to what it persistently studies. The laws of that branch of science control in its judgments. They determine its modes and methods of thinking. Their tendency is to materialize the mind, and to compel it to think on all subjects mental and moral as if there were no other laws in the universe than material laws. So far as his thinking goes, a man is apt to see everything through the spectacles that have insensibly come over his eyes from the specialty with which he is persistently occupied.

As an illustration of what I mean, let us take the work of a modern man of eminence,—a man of whose goodness and greatness those who know him personally have no doubt. I mean Professor Henry Drummond, whose lectures at the Lowell Institute here in Boston commanded so much attention. The book which made him famous is entitled "Natural Law in the Spiritual World." "None," says Professor Drummond, "except those who have passed through it can appreciate the radical nature of the change wrought by science in the whole mental attitude of its disciples." And he goes on to teach with much wisdom and learning, and with that charming style of his which makes it so easy and so delightful to read him, how the thought of evolution permeates everything. He seems to be quite unconscious of assuming very much more than he can

prove, in writing his book on the principle that "natural law," by which he means the law which is revealed in material nature and deduced from it, is identical with spiritual law,—the law of mind, and will, and imagination. His book is constructed on the assumption that natural law and spiritual law are identical. He assumes that the same laws which govern vegetable and animal life govern mind. I venture to say that he assumes it without proof. Indeed, we may say with much of positiveness that it is utterly impossible that the laws of the spiritual world, considered as a whole, can be identical with the laws of the natural world. The simple facts of free will and moral responsibility are themselves enough to create a radical difference between the two worlds. I know from personal communication with Professor Drummond, that if he had to issue his book now for the first time, that it would come from the press simply as an analogy and not as an argument,—simply as supplying illustrations which are wonderful and helpful. It is only fair to say that much. But it is an illustration of the fact, of which there can be little doubt, that the devotion of the mind to scientific pursuits is apt to engender a certain outlook on the universe, which, if not corrected by other considerations, may find it difficult to recognize the signs of the supernatural in nature and in history.

Now, if a man like Professor Drummond, who is a remarkably open-minded man, can fall into this error of assuming that material law is the measure of all law, what are we to expect from men of a much lower type than he? Is there not ground enough and reason enough to say to all specialists, Beware of assuming that all the laws of the universe are to be interpreted by the laws you find working within the narrow area to which your study and observation are confined? Is there not a necessity to say to men who are specialists, Be sure you do not live and move and have your being within the limits of your specialism? Correct the tendency which your specialism creates to learned narrowness by taking excursions into all kindred departments of knowledge. It is marvellous how a man may all but destroy his ability of enjoyment in the region of his higher faculties—the poetical and historical faculties of his soul—by a servile attention to things that are minute and simply external. I was reading not long since, in a book by Dr. Birkbeck Hill, of Oxford, the following incident, which is by no means a bad illustration of what I mean. "A friend of mine in this University told me that before he had come up to Oxford he had read Virgil's '*Æneid*' through with great delight. In preparing for the examination known as '*Moderations*,' he was taken through it by his

tutor once more, who treated Virgil not as a great poet, but as a convenient instrument of instruction in the niceties of grammar. Under the guidance of this teacher—

‘One whose hand,  
Like the base Indian, threw a pearl away  
Richer than all his tribe’—

my friend gained his first class and lost forever his enjoyment of the *Æneid*.

“The man who would use a great poet for beating grammar into a boy, who would parse ‘Hamlet’ and analyze the ‘Paradise Lost,’ would not for one moment hesitate to botanize upon his mother’s grave.”

With all the advantages of specialism, and they are manifestly many, it is necessary to recognize that a man’s specialism may so tyrannize over him as to drag him down out of the freedom and largeness of his manhood into being simply an oculist, or an aurist, or a dentist,—the laws of specialism so controlling the man that he views everything on earth, above the earth, and under the earth as a mere mechanic, and not as an artist. Even a man who is technically an artist and paints pictures may and often does become a mere materialist, a copyist of the externals of nature, with no imagination and no spiritual faculty whatever. The Greeks themselves, when they had attained to the highest competency in sculpture ever reached in the history of the human race, seemed to lose all ability except the one ability which has immortalized them. They had studied the human body and the art of expressing it in marble until they lost all sense of modesty and decency, all ability of appreciating the moral and intellectual, so that a Pericles was a nuisance to them, and for Socrates there was nothing better than the cup whose content was death.

While, therefore, we pride ourselves on the wonderful advance we have made in dentistry, surgery, and other departments of knowledge and achievement during the last half-century, there is a necessity for reminding ourselves of the tendency of an age of specialists to produce men in large numbers who are illustrations of learned narrowness, men whose minds are warped, sectarianized, and materialized,—men whose world is a very much smaller world than it would have been if they had given serious heed to other studies than the bread-and-butter studies of life.

Moreover, it ought to correct our tendency to conceit and self-

congratulation when we remember that with all our advance there are some things—yes, many things—which animals and even insects can do better than we can do. In their special line, bees and ants are capable of giving points to men. The business aptitude of ants is as great or greater than that of men. The science of government in the United States appears like the veriest tyroism when we go to the bees. Our rebuke of laziness and do-nothingism is feeble indeed compared with the practical indignation shown by bees to drones. "The more I know of dogs," says Madame de Staël, "the less I believe in men." We might add: the more I study insects, birds, and animals, the less I pride myself upon my mechanical superiority and my genius as a specialist. There is scarcely anything that man can do along the lines of these modern specialisms, however wonderful it seems, that cannot be eclipsed by something which some insect or bird or animal can do.

Man's superiority is in the connecting and associative faculties of his mind. His ability of connecting his knowledge with all other knowledge; his ability of large discourse, looking before and after,—yes, and we may add above and below. He connects this earth with that multitude of earths which we call the planetary and stellar systems, and thus realizes that he is not only a citizen of the world, but has an inheritance in a universe. Not only has he world faculties, but universe faculties. He has little use for them at present, but every germinal unused faculty has a promise and prophecy in it. I think it was that very extraordinary man, the late Professor Sterling Maxwell, of Cambridge University, England, who suggested to us that in our nature there are latent faculties for which, in this present world, we have no use. Apart from their existence, it is, according to Professor Maxwell, very difficult to account for certain peculiarities in the higher faculties of men. This tendency of men to associate the known with that which the known suggests,—to associate the seen with the unseen,—a tendency found in all the highest natures, puts man in the scale of being far above every other creature occupying this earth. If this competency is distinctive of man, it indicates that his manhood consists not in anything in which he is like other creatures, but in that in which he is unlike them. Manliness is something quite distinct from animalness. It is only as we conquer and subordinate the animalness in ourselves that we develop the manliness.

We have often been reminded that there is such a thing as *professional pride*. I think such pride to be good and worthy. Do we not owe to the profession to which we belong such character



and conduct as will add to its worth, respectability, and dignity? We hold the reputation of other men in our keeping, as well as our own. Every profession has in it men who are unworthy of it, men who regard it simply as a business by which to earn bread and butter. Doubtless there are such vulgar souls in your profession, as there are in mine. I say "vulgar souls," using the word "vulgar" in the way in which it is used by that artist in the use of language, John Ruskin. "Vulgarity," he writes, "consists in a deadness of the heart and body, gentlemanliness being another word for an intense humanity." Vulgarity shows itself in inability to feel or conceive noble character or emotion. This is its essentially pure and most fatal form.

There is no reason in itself why the profession to which gentlemen here present belong should not give time and opportunity and stimulus for nobler studies than those immediately suggested by a narrow view of its area. There is no reason why in it, as in surgery and medicine, there should not be developed a professional pride. But it is well for us all sometimes to face the great facts of life and interrogate them. Whatever our business in life be, it may be dignified or undignified. We may be artists or mere mechanics. As Gladstone says, "Our life may be food to us, or it may, if we will have it so, be poison." Every profession has its temptations, mine and yours. You know what yours are better than I can tell you. To cherish professional pride is helpful to triumphing over these temptations. An organization like this, and everything else which lends dignity to the profession, is to be fostered as good. If it were to be assumed that your profession had already attained to the utmost of its excellency, such an assumption would only indicate how narrow were the limits within which your profession moves.

The time will come when a visit to the dentist will have no more terror in it than a visit to the physician, who simply feels your pulse and looks at your tongue and asks you the usual questions, and then gives a bottle of sugar-coated-pills. It is this perpetual striving after excellence on the one hand or the want of it on the other which, more than the original difference of gifts (certain and great as that difference may be), contributes to bring about the differences we observe in the works and characters of men. It becomes us never to forget that while professional and other men seem to be doing so many things, each and all are doing one thing,—the building of character. No man living can escape that. Every day and hour that is going on. That most popular

of all professors in the Universities of Scotland, Professor John Stuart Blackie, of Edinburgh, may be a trifle dogmatic when he says, "The merely professional man is always a narrow man; worse than that, he is in a sense an artificial man, a creature of technicalities and specialties, removed equally from the broad truth of nature and from the healthy influence of human converse.

"But if a man will fix his mind on merely professional study, and can find no room for general culture in his soul, let him be told that no professional studies, however complete, can teach a man the whole of his profession; that the most exacting professional drill will omit to teach him the most interesting and most important part of his own business,—that part, namely, where the specialty of the profession comes into contact with the generality of human notions and human sympathies. Universal experience, accordingly, has proved that the general scholar, however apparently inferior at the first start, will, in the long run, beat the special man on his own favorite ground."

Such an opinion of such a man justifies, I think, my choice of a theme on which to offer the ideas I have been able to suggest,—the advantages and dangers of specialism. A young girl who had an offer of marriage she wished to accept submitted the matter to her father, who did not wish to have her vacate his home, and so advised her against matrimony, using as an argument the quotation from St. Paul, "Those who marry do well; but they who do not, do better." "Well," said the damsel, "I love to do well; let those do better who can." In accepting your invitation, I thought that perhaps I was doing well; probably, by this time, some of you will be thinking that if I had declined, I should have done better. However, I may shield myself under the example of that apostle who, when the lame man at the beautiful gate of the temple asked an alms, replied, "Silver and gold have I none; but such as I have, give I thee." I hope that whenever I meet any of the gentlemen present, it may be under conditions when I shall have as little pain and as much pleasure as on this festive occasion.

## HYPNOTISM, ANIMAL MAGNETISM, AND PERSONAL MAGNETISM AS APPLIED TO DENTISTRY.<sup>1</sup>

BY W. G. A. BONWILL, D.D.S.

MR. PRESIDENT,—What do I know about hypnotism, you might well ask?

Does any one know anything definite as to the truth of it; or, if genuine, who can explain how it is done, or can it be reduced to a science to be depended upon?

The object of this paper is to show that hypnotism plays only a small percentage as an obtunder of pain; that hypnotism is due to a certain condition of the subject and not to the power of the one operating; that there are various means to produce temporary effects favorable as helps; that in analgesia we have a condition of suspension of the voluntary so far as to increase sense of touch and sound, and yet to completely annul pain, and that it can be produced in many ways; that it is not suggestion but strong impression made by the operator; the deaf can be influenced through their language, but it must be impressive; that it is not necessary in any case to try whether the patient is in a natural hypnotic state or that this can be induced by artificial means.

When once the operator will study his case and follow directions here given, success will come, as the will or voluntary brain can be suspended and held in abeyance. Not every man can command or govern. Some men can and not fail in anything they undertake.

As horses are managed by making them understand there is a master, so with human beings.

Its history is so well known that it is not necessary to make more than a brief allusion to it. Like all other good things, it has had a most terrific fight for its existence. Many brave men have gone down because they asserted it was a fact; many reputations have been forever blasted for advocating it. And to-day it is far from being believed by scientific men, although many have espoused its cause, and the learned societies are gradually endorsing it as a great principle, while its action is not in any way understood. For half a century a war has been waged against it, and still it lives, and it will endure.

As early as 1733, Mesmer, a German physician, first propounded

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<sup>1</sup> Read before the Odontological Society of Pennsylvania, November 11, 1893.

the theory. It was then known as Mesmerism, animal magnetism, psychology, and personal magnetism, but now more scientifically named hypnotism, or artificial somnambulism. It was at one time called Braidism, after an English surgeon, who was the first to prosecute its phenomena scientifically. Mesmer claimed the effect was produced by the power of magnets in the hands of an expert. It was claimed that the will of the operator could control that of another by a certain animal magnetism going out of his (the operator's) body, and only a few could claim such power. It is now held that no force of any kind emanates from the operator. It is regarded by many as artificial catalepsy.

Hypnotism more fully expresses the meaning, "putting to sleep." It is also an induced somnambulism. That there is a certain percentage of persons who are susceptible to it is a fact. Why they are so no one, so far, can even surmise.

It was opposed by Christians because of its miraculous effects, they believing the day had passed for such wonders. The Catholic church held that it alone had such power. Scientific men opposed it on the ground that what could not be scientifically or philosophically explained could not be true, and because they could not see the *modus operandi* they refused it a hearing.

It is not surprising that it should have had such opposition, for it claimed much, and its effects were marvellous. I remember when I first witnessed the experiments I was quite a boy; it excited my curiosity, and struck terror to me.

In 1855 a class was formed to learn its mysteries. We each paid five dollars for the instruction, with a written pledge that we would not reveal the secret. We were allowed to practise it privately or publicly, but must hold the pledge inviolate.

That five dollars was the best investment I ever made, for it opened my eyes to what might never have been revealed to me.

While much has been taught and demonstrated, yet there remains much to be revealed to enable the majority of men to do what seemed impossible to them. Dr. Fillebrown has written for the benefit of dentists, but he does not give up the key to its action, as I conceive should be done, to enable others to practice it. He refers you to Bernheim. The common belief that only weak-minded persons were good subjects has been exploded.

It is certain that those of strong resistance or strong controlling will power cannot be good subjects. Those who have little resistive power can become good subjects. Fifty per cent. of adults are susceptible; most children can be directed; more women than

men. The possession of the power has led to many abuses, and it is well to be on guard for unscrupulous men.

It is a means by which one can readily produce in the mind of the subject such a lasting impression as to injure health, or it may promote it.

The action is not, *per se*, abnormal, yet in the play upon the imagination can leave the subject a prey to the suggestion or command of the operator.

That it is the means of curing diseases both organically and functionally, when intelligently used, should be believed. Physicians who have relied solely upon medicine for therapeutic effects should acquaint themselves with its value and no longer saturate their patients with poisonous doses that do more harm than good.

Much of the prejudice of the public would be overcome if they were properly taught that it is not so much in one person being able to hold another in subjection as that they, or a certain percentage, are liable to be controlled simply from a peculiar condition of their own body and mind.

While it takes several minutes before any change takes place to enable one to control and direct thought and action, in many cases but a very brief period will suffice. A command energetically made by one having the gift of ordering another to obey will be sufficient, and it is not necessary that it should be acted on at the instant, as the impression can be left on the mind, and in days after the command will positively be obeyed.

When we survey the subject in the phases of every day existence we find our actions are governed by influences we cannot fathom. We know we are led captive by the power of woman, and, *vice versa*, women by men. The presence of an animal will paralyze persons and make them lose all control of their judgment. We listen to an orator and are led captive not so much by his reasoning, but by his presence, his voice, his every gesture. There evidently is some force going out from one who has personal magnetism, although it may not be the same as hypnotism. While but few are born with such power, it can be cultivated and practised.

You hear of induction in electricity. It is as wonderful as hypnotism. There you see actual power manifested through the medium of the air, and it is only a mechanical force. Is it to be doubted that man possesses a power that may pass from him and affect another and force him to obey commands?

You tell a person to meet you at a certain time. The voice is

the medium of communication, and the vibration is manifested as would be induction from the vibrations of a dynamo.

An hypnotic patient or subject becomes an automaton, and will run as a machine, without any power to resist. That the human mind can be dominated by an idea alone, without it coming as a command from another is often seen in cases of crime. In natural sleep the mind can become somnambulistic, and such subjects act as if they were perfectly awake and in their right mind.

Faith has done much to remove actual organic diseases. Christian Science has accomplished much in its peculiar way to rid sufferers of bodily and mental ailments through teaching self-control and a belief in their own powers. The history of the human race gives thousands of facts as to cures from various methods, long before hypnotism or the assumed power of magnets were conceived and practised. Observe how many people wear magnetic rings upon a certain finger, positive as to their magic therapeutic effects. It matters not under what name the treatment is made, certain effects and cures are produced. The various modes of medical practice, as extreme and antipodal as possible, yet, each and all, do a work not to be gainsaid.

So much has been demonstrated through investigations upon this subject that gradually the real cause of all such phenomena has been brought to light, and it would seem that we are upon the threshold of an actuality which may dispel the darkness that veiled the hidden mysteries to men.

It was not until M. Leibault, in 1862, after continued experiments with hypnotism in the hospital at Nancy, in France, was it taken up by the better class of medical and scientific men and received extended acknowledgment. His therapeutic applications were so satisfactory that the power could be relied upon in the many and various cases he relates in his exhaustive work on "Hypnotic Suggestion." To him should be given the credit for the absolute system of treatment through this agent.

Then it is to "suggestion" alone, as he has named it, that we are to rely for our success. But you are not to understand that the merely asserting to your subject that a certain effect can and will be produced upon him will accomplish the object, for there is a condition of mind and body that your patient must already have or gain, without which suggestion will fail.

When I was taught animal magnetism, or psychology, as then known, in 1855, it led me to adopt it partially, and it was modified to suit my practice. It is one of many adjuncts in gaining the

confidence of my patients and placing them more completely under my control in causing my operations to be less painful and giving wonderful assistance in making my practice more satisfactory to my patient and myself.

I found there was such a thing as personal magnetism, which has no relation to hypnotism. I am sure that some men can have such a personal force that they can control others and draw to them, and, while it can be cultivated to a considerable degree in many, it is a born quality or power by which good or evil may be done.

Some persons can be overcharged with electricity, both frictional and from dynamic source, enabling them to light the gas. Is it any more to be doubted they can have other powers? When I first promulgated rapid breathing I was charged with being dishonest, as it was believed I performed this through personal magnetism.

I have assured you that it is a fact not to be ignored that hypnotism is all that is claimed for it, both by empirics and by some scientific men, in its action upon the normal subject and in its therapeutic powers.

The history of hypnotism informs us that from the very first it has been used, not for amusement only, but as a great healing agent, and so wonderful were the results that scientific men have been compelled to bow to the inevitable.

In commencing to operate, the command must be given as a general of an army would issue an order. It is in the way it is done. For instance, if I were to simply go up to my subject and whisper in a low tone without any positive force, he would not be impressed with the order and most likely not comply. But when I say to him, in a loud, stentorian voice, that he *cannot do so and so*, or he *must do thus and so*, he has no will to do other than I command.

Now, this is a peculiarity of hypnotic subjects. It is different, as I think I told you, with personal magnetism. Forty per cent. are subject to this hypnotic state, or can soon be placed so by the simple concentration of their minds upon any one thing, as my teacher did by simply having the individual close the eyes and count his pulse for fifteen minutes.

If you will pause just here you will see that it is the key to the philosophy of sleep.

I took the hint from this, and when inclined to insomnia I would place myself in bed in some easy position, and with one finger—not all my fingers—would commence to scratch my head

very gently. My attention then was riveted on what I was doing. While thus engaged my mind was directed to this alone, and it could not, so long as I kept up this gentle scratching, let it run on a second thought. If you accept this you see how easy it is for sleep to take place, for a few minutes at least when the mind is subjugated to the tyranny of *one* thought. It is dominated by one idea. You will find that the same thing is not attained if you use all the fingers of the one hand. It gives the brain too much to do, and is rather an excitant than a soporific. The same effect is produced by rapid breathing for a minute. The mind is diverted for that time, and with the rapid accumulation of carbonic oxide gas in the circulation, a double effect is produced.

Do you not grasp, then, that if it is impossible for any one to sleep with a thousand thoughts flying through their brain, that if the mind can be brought down to one thing it becomes a blank as far as other thoughts are concerned?

Take away your volition or power to control your voluntary actions, and you become an automaton, and are a prey to sleep because all is a blank, and only the involuntary life goes on.

The two principles in our system, the voluntary and involuntary, are acting entirely independent of each other, and to produce sleep the voluntary must be suspended, and this is secured when you take the step to draw upon your voluntary to keep your finger going.

Do you suppose that the performer upon a piano could for a moment go to sleep with all his fingers flying? The action forbids it. The brain is under too great a strain, and until complete exhaustion is produced sleep cannot come.

When you stop to reason or philosophize you see how much more rational hypnotism seems. It is no longer a mystery, but becomes a part of sleep itself.

You have another proof of profound sleep in the use of ether, chloroform, or any of the anæsthetics. It is seen in morphia and all such preparations. It is simply the annulling for the time being all voluntary life, and hence volition is no longer dominant,—the machine proper is running itself without any governor.

Another factor, not less potential, is "dead silence." Did you ever try to keep "still" for five minutes? Try it, and you have an effect of the voluntary subduing itself. Try to keep from moving a finger or blinking, or, if your eyes are open, try not to close them. The effect will be to bring that perfect repose the nearest kin to sleep.



There is yet another factor in this wonderful machinery of nature. From my experiments in rapid breathing I discovered that natural sleep will always result from legitimate labor during the daylight, when the heart and lungs have been over active, while the body is under action in all its parts. The excessive amount of oxygen taken while laboring sets free carbonic oxide gas more freely, and it passes to the lungs to escape.

At night, when the body and, of a sequence, all its organs are powerless to act at a normal speed, particularly the heart and lungs, the carbonic oxide accumulates in the tissues faster than it can be carried off by the sluggish heart and less active lungs, as the vehicle to convey it out of the system; and hence the effect of the carbonic oxide is the same as if you had actually breathed it in from the outside air.

Now, you should know that this poisonous gas has this soporific effect, and would extinguish the flame of life as well as it will that of a candle, if inhaled for a short period. But in this normal inaction of the heart and lungs sleep is most beautifully courted.

The rapid movements of the body during the day in taking in the excess of oxygen sets free from this normal activity of the function all the carbonic oxide gas as fast as the oxygen grasps it in its movements through the circulation. But in this case the heart and lungs are acting in harmony, as one to four. As soon as the day's labor is over the heart, while making its normal number of beats, is less forcible, and its capacity is not so great, while the lungs are less active to meet the demands of a weakened heart, and, at the same time, the involuntary action of every organ in the body goes on in order that the exhausted body, from the day's labors, shall be supplied with nutrition before the dawn of another day, and all the organs shall be renewed with vigor; and, while all this is progressing, the carbonic oxide gas is not thrown to the lungs to escape, and it has its effect upon the brain while it is lingering in the tissues and nerve-centres and the central organ the brain. Is not this a rational conclusion?

If you will argue this out as I have done you must accept the conclusion of the philosophy of sleep, and that the carbonic acid gas is the active agent in its promotion; and that hypnotism, or, in other words, artificial sleep, has carbonic acid gas as one of its principal factors.

I will now take you a step farther. You understand that the principal thing to be considered in hypnotism is what is now called "suggestion." That is, the hypnotic subject would always remain

himself unless some one were to step up and command or suggest or order him to do something against his own will, which may be now at its lowest ebb. You must place some thought before his mental vision, or through his sense of hearing alone, and with force demand its recognition, which is more than a mere suggestion.

This demand must be kept up or a series of thoughts put before his mind which will lead him to carry on a system of action.

While this must be done to be in any way successful in hypnosis, it can be used in every-day practice of dentistry and medicine without the patient being hypnotized.

It is astonishing how nearly every patient can be effected by forcibly declaring to them, "It will not hurt you." "If I am going to hurt you I will tell you." "Fear not, for I can assure you that you will be quite or entirely free from pain."

Children are easily controlled if their attention can be secured. But they are addicted to spasmodic crying, and until that is over it is impossible to do much with them.

Finally, I will lead you a step farther to the mode adopted to produce effects on patients which, while not hypnotic, enables me to do whatever I please to their teeth.

*First Stage.*—When the door bell is rung to have my maid go as quickly as possible and never keep the subject waiting in suspense for a moment. The maid is bidden to always show a pleasant face and to be very polite. Patient is ushered into the hall and a beautiful Madonna greets the eye. A step on and a large mirror that covers the hall to the ceiling gives the hallucination that the house has a very long hall and a series of rooms. This effect is produced by another large mirror directly opposite in the parlor. The parlor should be open, and while not extravagantly furnished, should present a pleasant view. The view, as one proceeds up the steps, should be to attract attention, and, the drawing-room gained, the maid gives any attention needed or demanded. Books or papers are given them instead of letting them sit in idleness until the operator presents himself.

As soon as possible he should go to the patient and speak in such manner and grasp the hand with a touch that inspires confidence. If a stranger, take one minute to give them something pleasant to look at or read. Handsome engravings are always entertaining to young and old. Have plenty of chairs, that a choice can be made. Have nothing so fine and luxurious in this drawing-room that patients are afraid to touch or disarrange. Let everything be free and easy. Assure them you will keep them waiting but a mo-

ment. If extremely nervous, then I have them sit profoundly still, and draw their attention to one object that this hypnotic effect may be cultivated or drawn out, if they are possessed of it, that they will be very much better prepared for the operator. Never let patients tell you a word about their case. Direct them to keep still or silent, and not even hint where the trouble lies. Find it yourself, and you have gained their confidence at once. Have them wait, and allow no one to leave your office until you have done something to soothe their pain and allay their fears. Assure them that they are not so badly off as they surmised. Do not fear to spend a moment in conversation to them on leaving, and forcibly and smilingly assure them not to think of you while away and up to the time of next visit. Do not let your maid attend to this part of your office. Nothing can take your place.

So much for the entering wedge—the *entrée* into your house and office—to have an hypnotic effect.

While your voice is the principal thing over all to bring out the result, these minor points speak volumes in silence to captivate and ensnare your subject.

Some I would have sit with their finger on the pulse for ten or fifteen minutes before I commence examination. To a thoughtful operator there are many avenues by which he can hypnotize,—electrically by induction, personal magnetism, etc. All of this and more I could give you.

Now, while I have written this essay on hypnotism, and have shown you that it is a great fact, and have attempted its solution, yet I must impress upon you to speak with decision, and never aim to discover in advance whether the subject is an hypnotic.

To one conversant with personal magnetism, the fact can be relied upon, that in the voice, look, and touch, the bulk of people can be ruled or controlled, and no hypnotism about it. By diverting the attention or mind at the instant, there is no failure where the pain is instantaneous. When extracting temporary teeth this is all I do, and before the little patient can take one long breath the tooth or teeth are removed.

There are many cases where I produce a more decided effect by playing on the imagination, by having them breathe the air through a tube, as if an anæsthetic were being given. Some minds are very susceptible to such a method. Do not fail to accept the fact that, aside from all these little subterfuges, without saying a word, while breathing I can universally affect them.

In conclusion, cultivate the sense of touch, sight, and voice to a

great degree, and be always truthful, and, with sharp instruments, used with skill and great rapidity, you will not hurt them; you have in your grasp the many means by which dentistry may be robbed of all its horrors.

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### PYORRHOEA ALVEOLARIS.<sup>1</sup>

BY DR. F. T. VAN WOERT.

THERE is a possibility that I may get myself into some difficulty before the evening is over, but shall not regret in the least having done so if I can provoke a discussion which will throw some light on the subject I have to present.

Much has been said and written relative to so-called "Riggs's disease," or pyorrhœa alveolaris. In the past seventeen years many theories have been advanced as to the conditions of both hard and soft tissue, and various treatments have been recommended; still, thousands of teeth are lost every year from a lack of knowledge as to what the disease really is, of its origin, and how to treat it.

Like many of you, I have felt very much discouraged in the efforts to relieve my patients of this dreaded difficulty, and after a vast amount of wasted labor and energy, to say nothing of the great anxiety suffered, I decided about two years ago that I must abandon all hope of success in combating the trouble, unless I could find a different theory of the disease and consequently a new treatment. It was my intention to place this matter before you in a way that would leave as little doubt in your mind of the accuracy of my conviction as in my own. Please do not misconstrue this as meaning that I claim to have solved the mystery, but simply credit me with sincerity in my conversion to the statements made, and either join me in the new faith or show me the error of my ways, that I may not labor under a delusion.

I regret exceedingly circumstances have made it necessary to present this paper in this crude form: in the line of my investigation it has been a very difficult matter to secure specimens that I considered of sufficient value to prove the theory. My labors having been in the dissecting-room and at autopsies; such cases as were of value to me were held by students who would not give them up, and I could not mutilate the bodies upon which autopsies were held without disfiguring the face to make it noticeable to the friends

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<sup>1</sup> Read before the New York Odontological Society, October 17, 1898.

of the deceased. I hope, however, and expect to get sections to prove all that I claim, and which will be considered worthy of space in the collections owned by this Society.

Such cases as I examined in the dissecting-room showed the loss of hard and soft tissues, calcareous deposits, and all the symptoms, other than the flow of pus, that the disease had been present. In four cases I had the good fortune, through the courtesy of friends in the medical profession, to be called in consultation upon persons suffering with genuine so-called pyorrhæa alveolaris and other incurable diseases, and subsequently was present at the autopsies and made careful examinations in each case without finding the least trace of necrosis. Could I have presented sections from these I am confident that you would believe as I do.

To distinguish this form of carious bone in the mouth of the living I contend is almost an impossibility; the alveoli, being a calsenious or spongy tissue, responds to the sense of touch to all the symptoms of a marked necrosis, and an exposure of the parts in other than the cadaver is out of the question; hence to diagnose in the mouths of patients as they present themselves to us is not practical unless this theory of necrosis be discarded.

If this is true, the operation recommended by Dr. Riggs and very generally practised is productive of more harm than good. Perhaps my manipulation in the performance of this operation has been imperfect, which would account for failure; but the fact that partial success has crowned my efforts in the avoidance of this treatment and the substituting of one almost the reverse, leads me to believe that I am not far wrong in my conclusions. I am satisfied that many members of our profession have had doubts as to the existence of necrosis in this disease. Two or three writers have said that there were but few cases where it was present, and I can but feel if they would look into the matter again, pursuing the course I speak of, they will proclaim, as I have, it never is. And I claim, as well, that there is but one form of this disease; that there are a variety of difficulties which may cause the trouble, I fully appreciate, but I do not believe that this is part of it. It may result in the same proportion that pneumonia or phthisis would follow a cold if not cared for in time. The great mistake has been that all the ailments of these parts have been considered a type of this difficulty, and little or no effort to so name them that a true diagnosis could be made.

I cannot better express myself than to quote from Dr. G. V. Black, vol. i. p. 953, in the "American System of Dentistry." And

while his article was written some years ago, still our position is practically the same to-day in this respect. He says,—

"This group of diseases has generally been passed over without very accurate description. They have universally been grouped together under one name. This name has varied with the different writers to such an extent as to have almost as many names as authors." And he felt that the time had come when the old names should be dropped and others introduced that are more in harmony with what is now known of the pathological condition present in each case.

This he acknowledges to be a difficult task, but absolutely necessary to accuracy. "It cannot be expected that the profession at large will have definite ideas of these diseases until we have definite descriptions under definite names. The term *gingivitis* I limit to those inflammations of the *gingivæ* that occur from constitutional causes, or the lighter forms of inflammation from soft deposits on the teeth. It may be argued, and justly, that all of the diseases of this class begin with an inflammation of the *gingivæ*; but when another factor has entered into the case, probably in its inception, it is proper that that factor should be expressed; hence the term *calciæ* inflammation, indicating directly the nature of the cause that perpetuates the disease. This is seen in two forms, *serumal* and *salivary calculus*; but as these relate to the origin of the calculus that induces the inflammation rather than to the character of the inflammation itself, and as the two are often blended together in the same case, it has hardly seemed to call for a separate name. In the term *phagedenic pericementitis* I have again expressed the most prominent factor of the affection that is at the present time definitely determined,—its destructive character. It is true that the *calciæ* form is destructive, but not to the same extent. This disease is, in my opinion, caused by a specific form of micro-organism, but this has not been determined with sufficient accuracy to justify a name expressive of that conception.

"The names heretofore in use have been applied to the entire group of diseases, and among them no distinctions have been made. The most of them are now no longer used. The term *pyorrhœa alveolaris* expresses one fact common to all of these forms after they have made considerable progress, including *alveolar abscess* as well,—a flow of pus from the *alveolus*. It must be seen by all that when we come to a classification of these affections this term loses all distinctiveness and cannot be of use. Possibly this name might be retained as expressive of the whole group of diseases in which there is a flow of pus from the *alveolus*, but this could not

be of much value; especially is it objectionable after the use that has been made of it in the past."

This is about what I desire to say, other than that he does not deny the presence of necrosis. The disease which proves so fatal is one, I believe, confined to the peridental membrane, brought about by any of the other diseases to which the mouth is subject, and very often by inoculation in the use of instruments imperfectly sterilized, or rubber dam which has been in contact with the exudation from the pockets where the disease was in progress. I feel convinced there are many modes of conveying it from one mouth to another. No doubt many of you will not believe this, but I apprehend the day is not far distant when you will concede it as you have been forced to accept many other theories that seemed quite as ridiculous. My convictions are based upon practical experiment and careful research, and are not a mere fancy, and it will take more than a simple opinion to change my own views.

The loss of the alveoli is, I believe, due to a process of absorption such as takes place after the extraction of a tooth, and is an effort on the part of nature to dispose of that which has ceased to be of service. The weeping of serum from the diseased membrane calcifying upon the roots destroys the union of bone and tooth; and thus the function of the bone at that point becomes a thing of the past, hence its absorption.

In my method of treatment I begin with the first principles of modern surgery,—that of thorough sterilization of everything connected with the operation and the free use of antiseptics during it. First thoroughly free the teeth and surrounding parts of all food secretions, etc., without lacerating the soft tissues or getting the débris into the pockets; this is done with wheel-brushes on the engine, scalers, strips of orange-wood, and the atomizer, using a three-per-cent. solution of pyrozone in the latter, and frequent washing of the mouth with a solution of lysol; then, with a Koch's hypodermic syringe, the points of which have been ground smooth so that they will not puncture the gums, I wash the pockets with a five-per-cent. solution of pyrozone and follow by swabbing, so to speak, with the twenty-five-per-cent. solution of the same drug. This is accomplished by winding cotton on the points of orange-wood sticks shaped for that purpose, care to be taken in cleansing and sterilizing the hands between each operation. I keep two large finger-bowls on the bracket, filled with antiseptic solutions for freeing the mouth-mirror, instruments, etc., and a good supply of napkins to prevent contamination from contact with any of the

removed substances. I next remove as much as possible of the calcareous deposits without encroaching upon, or injury to, the peridental membrane, avoiding the alveolus; then I shape orange-wood like chisel scalers, sear the surface in the flame of a spirit-lamp or Bunsen burner, and with this I apply a saturated solution of trichloracetic acid, by dipping the points in the acid, and use them as in the act of scaling with steel instruments. The remaining calcareous matter can be softened so that all can be removed. Care should be taken to keep the pockets as free from saliva as possible during this last operation, which, when completed, I am satisfied of the removal of all the deposits; I wash again with the three-per-cent. pyrozone, applied with the syringe and atomizer.

It is rare that I operate on more than one-half of either the superior or inferior at one sitting, and allowing from six to ten days between each, and where there has been waste enough of the tissues to cause the teeth to be loose after healing I bridge them as recommended by Dr. Rhein. Many thanks to him. And for the great assistance of trichloracetic acid, I am under obligations to Professor Peirce. I am very much indebted to Dr. Allport for a part of the instruments suitable for the operation.

In conclusion, do not misunderstand this as meaning that I always cure this disease; in fact, I fear I never do, and to the date of this I know of no other treatment that can claim more, notwithstanding the positive declarations by some of the radicals in the old belief. All that I claim is a simple means of controlling the disease sufficient to keep many teeth in the mouth in a comparatively healthy condition long after they would otherwise be lost.

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#### **SOME DISEASES OF THE GUMS: THEIR CAUSES AND TREATMENT, WITH SKETCHES OF RELATED INCIDENTS IN OFFICE PRACTICE.<sup>1</sup>**

BY D. M. SABATER, A.B., D.D.S., M.D., NEW YORK.

THE pathological lesions which are liable to attack the tissues of the gums are very numerous, and, consequently, I will deal only with those of more common occurrence.

They may be conveniently divided into two groups: those with a direct, and those with an indirect origin, or emanating from other than external pathological disturbances, the former due to local, and

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<sup>1</sup> Read before the Central Dental Association of Northern New Jersey, Meeting, May 15, 1898.



the latter either to local or systemic causes. The direct are, first, gingivitis and ulitis; second, the benign epulis or tumor. The indirect local are: first, cloaca, from sinus in alveolar abscess, the result of devitalized dental pulp caused by various influences; second, perforations with discharge of pus from earthy degeneration, as necrosis, or from fatty degeneration, as caries of bone; these may be local or systemic, the latter form when favoring one of the sequelæ of any of the exanthematous fevers, or from syphilis. "Canker-sores," or cancrum oris, may be local or systemic,—generally the latter. Mucous patches, stomatitis, and pyorrhœa alveolaris are local manifestations of constitutional disturbances.

As is well known, gingivitis marginalis is a temporary condition of hypernutrition of the gingival margin and of the gums in general associated with the ordinary essential phenomena of inflammation,—namely, pain, heat, and swelling, with disturbances of function and nutrition, varying in intensity, extent, and duration. The non-essential phenomenon of inflammation is redness, which, although in this disease it plays an important part, is absent in some cases of inflammation.

*Etiology.*—Gingivitis arises from a direct mechanical or chemical irritation, inducing a disturbance of the cell elements of the parts involved. The principal mechanical and chemical causes are calcareous deposits, the presence of green stains which have strong acid reaction, excessive cleaning, or the use of unsuitable brushes with wide and strong bristles, or deleterious substances found in the composition of some tooth-powders. The use of charcoal and pumice-stone should be condemned not only for their irritating tendency, but also owing to the causing by the former of a well-marked pigmentation or tattooing of the gums.

*Treatment.*—Thorough cleaning by means of scalers of the proper form and size, followed by the judicious use of astringent washes. In severe cases, Church's tr. iodine may be used with antacids, such as bicarb. soda  $\mathfrak{z}\text{i}$  to aqua  $\mathfrak{z}\text{viii}$ . In chronic cases, besides the above treatment, I use, first, a four-per-cent. solution of cocaine over the surface of gums, and, five minutes after, a massage of oil of peppermint, oil of camphor, and aristol.

The following is beneficial in gingivitis:

R Tr. krameris,  $\mathfrak{z}\text{i}$ ;  
 Tr. opii,  $\mathfrak{z}\text{il}$ ;  
 Tr. myrrhæ,  $\mathfrak{z}\text{i}$ ;  
 Aquæ camph.,  $\mathfrak{z}\text{vii}$ .  
 To be used as a wash.

*Epulis* is a firm tumor of slow growth and variable size, springing from the margin of the periosteum. It often arises between the teeth, and, most commonly, on the labial side. It is either benign or semi-malignant in character; the former is fibrous or granular, and the latter, sarcomatous. The differential diagnosis is made by their manner of growth, their form, and their local manifestations. The fibroid or benign presents a flattened base with a distinct narrow pedicle (mushroom-like), is not extensive, resembles the gums in color, and is of slow growth; while the sarcomatous is sessile, extending into the neighboring tissues. It is of a deep color, presenting a dark-red or purplish spot; bleeds easily when touched, dislodges teeth from their normal position, loosening them by destroying the alveolar sockets.

The *causes* are difficult to determine, especially in the benign form. Its antecedent may be traced to the presence of a local irritation, as badly decayed and broken teeth, roots with ragged edges, or crowded teeth. The semi-malignant epulis, in the majority of cases, is caused by violence and mechanical injuries, as falls, blows, etc.

*Treatment* consists in the removal of the tumor either by ligatures or curved scissors, applying chromic acid or chloride of zinc, sixty grains to one ounce of water, to destroy completely its roots and prevent recurrence; or, better still, operate with the galvano-cautery when applicable. In cases of sarcomatous epulis, the operation consists in the removal not only of the neoplasm, but the surrounding structures, including teeth, alveolus, and periosteum, using chloroform as an anæsthetic.

Actual cautery in cases of persistent hemorrhage and rigid antiseptic measures should be observed, such as solution of bichloride of mercury 1 to 2000, carbolic acid, creoline, hydronaphthol, aristol, iodoform, peroxide of hydrogen, trichloride of iodine, etc. I prefer and use the first mentioned.

*Carcinomatous* or heterologous tumors are sometimes found primarily on the gums. They consist of epithelial cells found in an abnormal situation, and extend deep down into the substance of the gums. The most common is rodent ulcer, or flat cancer, changing to epithelioma. It travels through the system by the lymphatic channels, presenting glandular enlargements. The softer and more juicy the tissues affected, the sooner they are involved; when denser, there is retardation of this process. The younger the patient, the easier and more rapid the infarction of glands. I have seen two cases where there was no enlargement present, one

person fifty-five and the other sixty-four years of age. The bed of the excavations presented an unhealthy condition, marked by a distinct, pale, flabby appearance, with everted edges and total absence of granulation. It is generally found in the area of the molar teeth. Its growth is rapid if occurring after middle age,—a characteristic of all malignant tumors,—but if it occurs in early life its growth for many years is slow.

*Causes* are obscure, but they may be traced to a constant and prolonged irritation.

*Treatment.*—The same as in sarcomatous, though more extensive. Should there be a great infarction of the lymphatics and increased symptoms, the operation is of no value, as in these cases the prognosis is generally bad.

*Canker-sore*, or *cancrum oris*, appears at first as a vesicle, which affects the epithelium to the deeper layers, breaks, and forms a deep ulcer; the base is soft and presents a yellowish or grayish color, and decidedly painful. These lesions attack children more than adults.

*Causes.*—Neglected hygiene of the mouth, unhealthy surroundings, weak and debilitated constitution; in these cases it is well defined, often protracted and extensive; or it may be the result of injuries.

*Treatment.*—Cleanliness, application of nitrate of silver, sulphate of zinc, saturated solution of permanganate of potass., glycerotannin; and as a wash, chlorate of potass., listerine, or use *R Infus. cinchonæ, f3iss*; *liquor sodæ chloratæ, f3ss*, to bathe ulcerated surfaces.

*Mucous patches* are syphilitic sores which may be located at any place upon the mucous membrane of the oral cavity. They appear as white ulcers, which become deep and change to a red color, with raised edges and indurated surface and base, being always accompanied by other rational symptoms of syphilis. The difference between these lesions and canker-sores is well established by the evidence of the above symptoms, besides the history of the case.

*Treatment.*—Internally, by the so-called mixed method, consisting of hydrarg. protiodide or bichloride, and potass. iodide. Externally use caustics and antiseptics.

*Stomatitis* is a disease characterized by elevated small patches, like blisters, presenting all the local symptoms of inflammation, and followed by more or less ulceration of the gum's tissue; in some cases it covers a circumscribed territory, and in others often involving the tongue and cheeks.

*Causes.*—Some direct local irritation, as dental caries, extremely warm or cold drinks, corrosive substances, or the consequence of an altered systemic condition, from fevers or impairment of the digestive functions, excessive stimulation or smoking.

*Treatment.*—Immediate removal of sources of irritation, disinfectants and mild caustics on ulcerated surface. Should there be a low tone of health, occasioned by other diseases, give alteratives, tonics, and moderate exercise in the open air. In painful and extensive cases use the following:

R Cocaini hydrochloratis, gr. iiss;  
Sodii chlor., gr. xv;  
Glycerinæ, ℥ii;  
Aqum, ℥iii.

To be applied on the gums with a camel's-hair brush, and spray frequently with a solution of boracic acid. Internally give bromides.

In cases of fetor of breath, use—

R Liq. sodii chlor., ℥iss;  
Dec. cinchonæ flav., ℥v;  
Mellis rosæ, ℥iss;  
Spr. caryophylli, miv.  
For mouth-wash.

Pyorrhœa alveolaris, also known as phagedenic pericementitis, Riggs's disease, pyogenic gingivitis, loculis alveolaris, etc., as stated at the beginning of this paper, is a local manifestation of a systemic disturbance, which is due to the action of remedies exhibited for the relief of some constitutional disease. I refer to the preparations of mercury. It is a well-known fact in medical practice that the salivary glands become excessively irritated under the influence of this remedy, and their functional activity is increased to such an extent that an enormous quantity of saliva is secreted and poured into the mouth. It is also well known that ptyalin (organic ferment and active principle of saliva) has a very irritating effect upon the gum tissue, resulting in inflammation which cuts off its nourishment; the result is its detachment from the neck of the teeth, thus forming pockets, which are the chief and constant characteristics of the disease, and are receptacles for particles of food, epithelial scales, fats, etc., forming a mass to be soon infiltrated with lime salts. Here we have the beginning of salivary calculus, which through its irritation of the adjacent periosteum is being constantly added to by the lime salts thrown out by that membrane. This I believe to be the etiology in the

majority of cases of true pyorrhœa. In other cases it is due to an early neglect of the teeth, when particles of food are allowed under the margin of the gums. The disease may be circumscribed or diffused, of slow or rapid course, mild or severe in character. In an acute type there is generally a creamy pus discharge, while in the chronic form it is usually watery. In some cases a false abscess is formed at the molar's region, presenting an intense inflammation or discharge and great tenderness of the tooth, so that it may be mistaken for a true alveolar abscess from devitalized pulp. The application of a small piece of ice on the suspected tooth will reveal the true diagnosis. There are other conditions which cause loosening of teeth, as atrophy of roots, a rare occurrence and differentiated from pyorrhœa in the absence of pocket formation and discharge, the gums showing a distinct anæmic condition.

*Treatment* consists principally in thorough scaling and removing of foreign matters, avoiding laceration of gums as much as possible; firm ligatures, to get proper fixation and to avoid movements; also accurate articulation must be obtained; judicious scarification of gums occasionally to relieve congestion, which is always present; removal of offensive decayed roots, and administration of saline cathartics from the onset; strong tonics and most nutritious diet, and the use of antiseptics, alteratives, astringents, and mild caustics. I use, first, hydrogen peroxide with Farrar's syringe, and then warm aqua cinnamomi to clean out pockets. On my second treatment I follow the warm water application with a mild solution of nitrate of silver. The systemic treatment varies, as it must be in accordance with the history of each particular case. In cases of severe pain, use morph. sulph. gr. ii, aqua camph. ʒii, externally around pocket, and internally chloralamid gr. iii, sodium bromide gr. viii, to be taken in water at bedtime. In cases of great detachment of gums, use mild solution of chloride of zinc.

The latest remedies used in cases of pyorrhœa alveolaris, and which are highly indorsed, are trichloroacetic acid and pyrozone.

#### PRACTICAL CASES.

*First Case.*—In the spring, 1884, I was called by my friend the late Dr. Clarence H. Young to see one of his patients,—a man about thirty-four years old, apparently in very good health. He complained of smarting sensation around his teeth, especially the front ones. Examination revealed a condition of gingivitis. The doctor, after cleaning several teeth, noticed an unusual bleeding of the gums around each tooth, which he vainly attempted to control by

various ways. The hemorrhage was on the inferior jaw, from the central incisors to the first molar, except one bicuspid that was extracted the previous year without hemorrhage. The patient came back next day in the same condition, when he was advised to consult his family physician as to his general condition; he did so, and was found to be suffering with acute Bright's disease of the kidneys, and was placed under treatment at once. The hemorrhage continued for twelve days, gradually decreasing after the fourth day of internal treatment.

*Second Case.*—In November, 1879, Miss D., aged twenty-one, seemingly in good health; her parents living and healthy. On examination of her mouth, I found a small epulis between the left upper lateral and canine teeth. I advised its removal immediately. Bleeding followed, but it ceased in a short time. She had some other work done, leaving the office an hour and a half after in an apparently healthy condition. To my surprise, I was called that evening at ten, as she had a persistent hemorrhage. On arriving at her house, the family physician was doing his best to control the loss of blood. After three-quarters of an hour's work, we decided to use the actual cautery, as the last resort, which answered satisfactorily. The cause of this trouble was the anæmic condition of the patient.

*Third Case.*—On the 15th day of June, 1890, a patient was sent to me by a druggist from Twenty-third Street and Third Avenue. A young man nineteen years old, healthy and strong looking. He complained of excruciating pain in both sides of the face, slight inflammation and rigidity of the masseter muscles, caused by a difficult eruption of wisdom-teeth. I lanced the gums, which was followed by excessive bleeding, which I partially succeeded in controlling, but which did not entirely cease until the next morning, when it was brought under control with tr. ferri persulphas and constant direct pressure by means of cotton, cork, and firm bandages on the face.

*Causes.*—Obscure, probably due to an improper or insufficient fibrin formation.

*Fourth Case.*—In September, last year, Mr. C., thirty-six years old, good constitution and good history of health on previous year. This patient had slight form of pyorrhœa alveolaris. On his first visit I cleaned all the upper teeth, consisting of only twelve, as he had lost two bicuspids and two wisdom-teeth. The operation was attended with a very slight bleeding at the time. Three hours after he returned with his "mouth full of blood," as he expressed

it. The oozing was more marked at the molar's region. I had a great deal of trouble in checking said hemorrhage, which I did by carefully packing the pocket around the teeth with fibres of cotton wet with Monsel's solution of iron.

In consultation with J. J. Henna, M.D., of New York, we found a *fibroid tumor* in abdominal wall. The diagnosis was corroborated two days later by Professor Bull of the College of Physicians and Surgeons, and Surgeon to the New York Hospital.

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## INCIDENTS CONNECTED WITH THE TRIAL OF PROFESSOR WEBSTER.<sup>1</sup>

BY DR. LESTER NOBLE, SPRINGFIELD, MASS.

[On November 23 1849, Professor John W. Webster, of the Harvard Medical School, murdered Dr. George Parkman, a retired physician of Boston. The trial of Professor Webster in March, 1850, was at that time the most noted murder trial ever held in Massachusetts. The following brief account was given at the Union Meeting of the Connecticut Valley and Connecticut State Dental Societies, held in Hartford, May 16, 17 and 18, 1893, by Dr. Lester Noble, of Springfield, who with Dr. Keep was a witness for the prosecution.]

At the time the murder was committed I was a student in the Baltimore College of Dental Surgery, and was summoned as a witness for the prosecution. The crime was committed on Friday in the Medical College, Boston, after the students had all left. On the following Friday, Professor Webster was arrested. In the mean time he endeavored to dispose of the body; he cut it up, burned the head and large portions of the body in the laboratory furnace, hiding other parts in various places. The destruction was so effectual that the most important evidence for conviction was the identification of the artificial teeth. The question had been raised whether Dr. Keep and myself could surely identify these teeth, after they had been subjected to such a heat, as those which we had made for Dr. Parkman, and which had been worn by him. This evidence was of vital importance, for if we could not prove that the jaw and teeth were Dr. Parkman's the prosecution *could not prove his death*.

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<sup>1</sup> Read before the Connecticut State Dental Association, Hartford, May 16, 17, 18, 1893.

Further, if they failed to prove the death of Dr. Parkman it was impossible to demonstrate that Dr. Webster or any one else had killed him, hence the importance of Dr. Keep's and my testimony in the case.

At this time there was a supply of manufactured teeth on the market, yet they were all single teeth, and it was considered altogether more desirable for a dentist to manufacture the artificial teeth used in his practice if he were competent to do so.

There were found among the charred human remains in the furnace an upper and a lower set of *block* teeth; the gold plates were melted to nuggets, the lower teeth somewhat injured, but the full upper set in three blocks was perfect, except being slightly bent. I will now state Dr. Keep's mode of manufacturing artificial teeth, to show how it was possible to identify them. After the plates had been fitted, and a set of teeth carved out of wax, the exact size and style required, moulds were made. Everything in plaster connected with the case was carefully kept and labelled in a box by itself, and this numbered and entered in the catalogue.

When the teeth were moulded they were baked slightly, just enough to give them strength, and yet be easily cut with a little twist drill held by the thumb and finger. We made four or six holes in a front block of six teeth and three or four in a side block of four teeth, and they must be absolutely parallel in both directions. The enamel was then placed on, and the gum color, inside as well as outside. This was a specialty of Dr. Keep's. The teeth were again baked until properly vitrified. This accomplished, a wood cylinder was fitted to each hole, and the gold wire to be used for pins, soldered on the gold plate, which fitted accurately this cylinder. With moderate pressure, the central block of six teeth would go to its exact position on the plate; the side blocks were put in place in the same manner. It may appear a difficult task to place these pins on the plate with such exactness that the block would go down without binding, but it could always be accomplished. When the set was wet or even moistened the teeth were perfectly tight; after a thorough drying they could at any time be removed.

Dr. Keep made a set of teeth for Dr. Parkman soon after I entered his office as a student. This was about a year before the advent of central air-chambers, and each plate was held in place by spiral springs attached to the artificial gum above the bicuspid, by a hole drilled through the block.

With Dr. Parkman's teeth I had more than a first acquaintance. He was a very nervous man, and occasionally would take out his



plates and put them in his coat-tail pocket, and soon he would forget them, and when he sat down the teeth would suffer more or less, necessitating repairs. I must have repaired those plates at least half a dozen times. The lower jaw had on the left side, the cuspid, the lateral incisor, and the root of the first bicuspid; on the right side, the cuspid and the roots of the first and second bicuspids. The gold plate went over these roots on both the right and left side and around the three teeth which were entire. All the teeth from the cuspid back on the left side were in one block, and those from the first bicuspid on the right side were also in one block. There was also the small block of three incisors. Any dentist will see that it was an extraordinary shaped plate, requiring a very unusual block to fit it. Dr. Parkman insisted on having the plate made over these roots; when Dr. Keep objected Dr. Parkman said, "I pay the bills; I want you to try it, and do the best you can!" The lower teeth were ground upon the inside to make room for his tongue, thus grinding off a portion of the gum color. I was present when Dr. Keep ground them, with an old copper cent for a wheel, and the addition of water and emery. The teeth found in the furnace fitted exactly into our moulds, and they plainly showed the marks of the grinding, and the holes where the spiral springs had been inserted. Further, there was no mistaking the peculiar shade of gum color and of the enamel of the teeth made from Dr. Keep's secret recipes. There was in the Dr. George Parkman box of models, duly marked and dated, a model made from a wax impression of the lower jaw, showing the number and position of the teeth and roots which were there when the teeth were made. The charred and broken lower jaw had them in the same number and same position as the plaster model, made three years before. If there had been found just one tooth or root of a different class from those the model showed Dr. Parkman to have had, it would have been a powerful argument for the defence, but, as it was, the identification was complete. Professor Webster was convicted, and hung in the following August. Before his death he made a confession of the murder.

## Reports of Society Meetings.

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### NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, October 17, 1893, at the New York Academy of Medicine, No. 17, West Forty-third Street, New York City, with the vice-president, Dr. Brockway, in the chair.

The minutes of the previous meeting were first read and approved.

#### INCIDENTS OF OFFICE PRACTICE AND CASUAL COMMUNICATIONS.

Dr. Perry showed some new corundum wheels, which had been sent to him by Dr. Darby's assistant.

*Dr. Mitchell*, of London.—I have a new method of attaching a porcelain face to a pivot, where the face has been broken off, leaving the pivot *in situ* and in a solid condition, and where it would be inadvisable to remove it, with the collar or pin perfectly firm and merely the face broken off. The method of repairing it is to cut the pin off, and grind it down, and with a separating file or (as I prefer) a small circular saw in the engine, cut down to where the pin originally was, making a forked arrangement for the pin to set down in. Adjust the porcelain face in the desired position, and with a small amount of modelling composition take an impression of the back of the tooth with the pins running through the backing as far as possible, and let the impression material run over the point of the new face. Take it off, and pour carefully, so as to get a good impression, then remove, and you have the tooth set up in its new position. Then make use of an excavator or a sharp-pointed knife to cut away a portion of the model; and take a piece of very soft platinum and anneal it, cutting a couple of holes for the pins to go through, and making a groove near the base of the old backing so that the edge of the platinum may come down; leaving it in the condition so that when flush it can be finished up nicely. Stick together with stick-wax the backing and the tooth, remove carefully and invest in plaster, and sand, or marble-dust, filling the inside perfectly, and finish as usual. It is one of those little things in practice that help us considerably, for we all know the difficulty of attaching a porcelain face to a back and pivot in

position. It is also a practical operation. I can show you one that was broken off twice through accident after being in place for a year. It was broken through occlusion on the stem of a pipe, while playing polo. The second time the accident not only broke off the tooth, but also wrenched off a portion of the pin. I forgot to mention that finally the crown is set with cement.

Dr. Van Woert then read the paper of the evening.

(For Dr. Van Woert's paper, see page 30.)

#### DISCUSSION.

*Dr. Perry.*—Will you define a little more definitely one point you mention? You spoke of deposits on the roots of teeth, and also of micro-organisms. You guard against the danger of infection, which implies the presence of pathogenic germs. Will you state more distinctly your theory?

*Dr. Van Woert.*—I am under strong conviction this disease is infectious, and is conveyed from one mouth to another through carelessness in sterilizing instruments, and the second application of the same piece of dam, as it is impossible to sterilize rubber dam without spoiling. It should never be used but once.

*Dr. Hill.*—What is your theory in regard to the loss of the bone?

*Dr. Van Woert.*—I believe the bone is absorbed in the same way that it is carried off after the extraction of a tooth.

*Dr. Perry.*—I like to see a man have a theory. I am given to having theories, and mine have been partly the same as Dr. Van Woert expressed this evening. I am not so sure about the infection, nor about the calcareous deposit being always primarily the cause. I think micro-organisms have much to do with it. I expressed my opinion before this Society ten years ago, in a paper on the treatment of the roots of teeth, when I said that teeth were lost by the encroachment of bacteria, caused primarily and principally by the accumulation of tartar, although tartar is not always the chief cause, for Dr. Tomes has shown, and many of us know, that sometimes teeth come out free from tartar. I have never ventured to undertake the Riggs operation of scraping the bone to any extent, for I have never seen the evidence that would convince me that his theory was true. The accumulations of tartar under the margin of the gum and the insidious action of pathogenic germs I think combine to do the harm. Many people who are affected with phthisis have this disease of the teeth. We know that the teeth of some people who are red-blooded and healthy do not loosen though they have large accumulations of tartar, while

in some people who are also seemingly healthy the teeth do loosen and finally drop out free from calcic deposits. How do you explain it? What connection there is between the loosening of the teeth and pulmonary troubles I do not know; but some day I believe we will find that bacteria are important factors in producing the condition. I think this Society is to be congratulated upon the starting of this plan of conservative treatment around the roots of teeth instead of the radical treatment that we have used heretofore. I believe that with all the remedies I have used I have accomplished more by the use of Buchan's carbolio soap and listerine than anything else I know of for lesions about the necks of the teeth. If we could induce our patients to daily clean out the pockets under the margin of the gum by the use of the syringe and prevent fermentation, it would help considerably; but there are other things to do in the world, and it is difficult to induce every one to use it. I think, as Dr. Van Woert said, the disease cannot be cured, although it can be alleviated. I do not believe in medicines as a rule, but I have seen as much good from the use of Buchan's soap as any remedy I have ever used.

*Dr. Littig.*—Dr. Perry says patients cannot carry around syringes, but they do have their fingers with them, and I have obtained better results by directing patients to rub their fingers on the gums, and using listerine, than with anything else. Many cases have been kept in good condition in that way. You do not always need the syringe to remove the food deposited in those pockets. The constant accumulation of food and of micro-organisms continues the disease, and the use of the fingers to rub the gums I find to be an excellent substitute for the syringe.

*Dr. Davenport.*—Will Dr. Van Woert kindly inform me whether I understood him correctly in advising the removal of only so much of the calculus with instruments as can be reached without laceration of either the gum or the peridental membrane? Secondly, I understood him to say that, instead of removing the calculus underneath the gum with scalers, even though the membrane has ceased to exist upon the root of the tooth where the pocket was, he applies an acid which so softens the deposit that it can be easily rinsed out. Considering the similarity between tartar and the inorganic portion of a tooth, is there not great danger of injury to the root by the use of an acid powerful enough to quickly (it must be quickly, as he says care should be taken to keep the saliva away) dissolve that substance? Will not the acid probably make sensitive afterwards the periphery of the live root?

*Dr. Van Woert.*—I think Dr. Davenport misunderstood me. I first remove all the deposits possible with the scalers. Upon careful examination it will be found that these deposits are never in direct contact with the membrane; they are thrown up a little above, and if care is taken in using the scalers they can be removed without injury to the membrane. The question of keeping the pockets clear of saliva is not a very grave one, for with napkins and saliva-pump it is an easy matter to keep them clear for an hour if necessary. It takes very little trichloracetic acid to soften these deposits, and the effect is more than pleasing. You need have no fear of a slough, and can rely on the gums assuming their normal appearance in a few days. I use it a great deal with very gratifying results.

*Dr. Davenport.*—What effect has it on the cementum?

*Dr. Van Woert.*—None that I can see, and Professor Peirce claims the same. I would say to Dr. Perry, I believe there are deposits in every case; while they are not always thoroughly calcified, they are there and they break down the union between the membrane, the tooth, and the alveolus, generally making more rapid inroads on the buccal than on the lingual surfaces.

*Dr. Watkins.*—What solution of the trichloracetic acid do you use?

*Dr. Van Woert.*—Almost saturated. I get an ounce bottle of the crystals and fill it with water. This makes a very satisfactory solution. Dr. Kirk, of Philadelphia, has used it, and he claims even more than I do for it. Drs. Hill and Brockway have also used it with satisfaction.

*Dr. Parker.*—I wish to make a little plainer than perhaps Dr. Van Woert did the question asked by Dr. Davenport. A year and a half ago the question he asked gave me trouble relative to the use of the trichloracetic acid. The first case I tried it on was in my own family. My wife had a tooth which I had been treating for some time, and I concluded to try the acid. That was about fourteen months ago. I used two or three applications, and the tooth is now entirely healthy. I have tried it in a number of cases, and upon teeth freshly extracted, to see if I could notice any effect, and I have never been able to see any harm. I am a great believer in trichloracetic acid.

*Dr. Mitchell.*—What is its action?

*Dr. Parker.*—There is no penetration. It acts on the surface.

*Dr. Mitchell.*—Is there any difference between the trichloracetic and chromic acids?

*Dr. Parker.*—I have never used chromic acid, and cannot say.

*Dr. Howe.*—I would like to record the statement that I have seen many cases of so-called pyorrhœa alveolaris not accompanied by calcareous deposits. I have two cases in hand now, in which considerable absorption of the alveolar borders has taken place, and from the beginning I have been unable to find any calcareous deposits under the gum margin. I have for many years made no attempt whatever to scrape the margins of the alveolar border, for I have not believed that necrosis existed in the cases that I have had to treat. Necrosis of bone is so different in its manifestations from what has appeared in my cases that I have been unable to understand some of the statements and methods of others. I have never seen even the slightest symptoms or developments indicating caries or necrosis of the alveolar processes. No bony sequestra or even granular particles of bone have ever appeared, nor have I been able to discover the bare surface of the alveolar borders with suitable probes, as I would expect to do if either of these diseased conditions were in progress. I congratulate Dr. Van Woert on the ability with which he has presented what I must regard as nearly correct views; and also for the moral courage with which he has taken this position.

Dr. Van Woert, I believe, expressed the opinion that the disease was caused by the calcareous deposit, or that the deposits are a factor in producing it. From my observation of cases, I have regarded a calcareous deposit as merely an accompaniment of some cases, increasing the trouble but not causing it. In others the deposit may approach more nearly to being a factor in its origin. Dr. Black has used the term "phagedenic pericementitis." That expresses to me the idea of a pericemental inflammation which results in destruction, and Dr. Van Woert's suggestion of the method of the alveolar walls disappearing appears very plausible. It seems to me, however, that the appearance or non-appearance of calcareous deposits on the roots of teeth is mostly an incident,—a much larger factor in keeping up the diseased process than in originating it. And it seems, also, that micro-organisms are over-rated in importance as factors in producing the lesions we are considering. Even if it should be shown that it were possible to carry the disease from one mouth to another by infection, it would not, to my mind, prove that the disease was caused primarily and solely by the micro-organisms, without a predisposition already existing. I think the time will come when the stress laid upon micro-organisms as causative factors will not be made so emphatic as it is now.

About two years ago Dr. Littig spoke to me of finger massage of the gums, accompanied by the use of stimulating lotions, such as listerine, being useful in the treatment of this trouble, and I have advised many people to pursue that practice, with decided benefit. I think it is an aid towards restoring an approach to normal circulation in the tissue.

*Dr. Perry.*—I cannot agree with Dr. Howe that the time for pathogenic germs has passed by.

*Dr. Howe.*—I did not say that.

*Dr. Perry.*—Perhaps I ought to be more explicit. I spoke to a gentleman who had spent three or four years in Europe studying medicine, and he said the scientific men there were becoming more and more emphatic in their opinion that many diseases are caused by micro-organisms.

*Dr. Howe.*—Was he talking of pyorrhœa alveolaris?

*Dr. Perry.*—He was talking of diseases, and if that is not one I do not know what it is. Many years ago I did a great deal of work with the microscope. I made, for quite a number of years, many careful examinations of all material I could find under the margin of the gum, and the number of micro-organisms present there was remarkable and produced the conviction that they were important factors. Of course, I do not mean that pyorrhœa can be cured when it has its origin through heredity. The hair cannot be prevented from turning gray, nor can the wrinkles on the face be smoothed when they appear. Neither can this disease in all cases be cured. In many persons it is incident to middle life and old age. It never will be cured while human nature is what it is. Several years ago, Dr. F. Y. Clark, on the floor before this Society, had a great deal to say about bacteria as important factors in producing decay of the teeth. He was very much laughed at. Is there any doubt to-day about their influence in caries of teeth? Not that they originate decay, for that is not claimed, but when the enamel is dissolved by acid action, and they can gain access to the dentine, they then become active factors in destroying the structure. And so I believe it is with the loosening of the teeth. When the gum becomes detached, whether by tartar or by a loss of tone or vitality of the gum or of the general system, so that a pocket is formed, micro-organisms find shelter and by their insidious presence become active factors in hastening the disease. How else can one account for the loosening and final loss of a tooth here and there, while the adjoining teeth in the same mouth stand firm and untouched.

*Dr. Howe.*—That is the opinion that I hold. If micro-organisms are the cause of this disease, then the conclusion would be that it is purely local. If you can sterilize the margins of the gums and the pockets, you will stop the disease and cure it right then and there. If it is a local disease only, patients that are regularly in our hands have a right to hold us responsible if the disease ever makes any progress. But if micro-organisms are rather an incident or development of the disease, which is primarily due to systemic conditions, then destruction of the micro-organisms will not necessarily cure the disease, although I grant it may be an essential prerequisite to recovery.

*Dr. Jarvie.*—This is one of the most interesting and important subjects we could possibly discuss. I believe that in the practice of every gentleman present, teeth in the mouths of patients over twenty-five years of age are lost more frequently from this disease than from all others put together. I certainly have, in the last five years, given it more attention than any other class of cases that come under my care, and while I think I know more about it to-day than I did, I do not know as much in regard to the cause as I would like, or as to the best means of treatment. I do think I have made progress. The principal feature, as I understand it, in the paper presented to-night is the statement in opposition to the generally-accepted one that no necrosis, as a rule, is present in pyorrhœa alveolaris. It is generally accepted from the teachings received in past years that necrosis is almost always present. For several years I have been an examiner in the Board of Censors in this State on this disease and its treatment, and I believe that nine out of ten of those who come before me tell me that one of the conditions of this disease is necrosis of the alveolus. I have never seen it, and for years I have been very firmly convinced that it is not a condition of pyorrhœa alveolaris. If this be true, what are we to think of the statement of Dr. Riggs and many other intelligent men, that in treating this disease they trim away and remove the *necrosed* borders of the alveolus? It has been stated here that there are almost as many cases of pyorrhœa alveolaris where deposits of lime were not present as there were cases where it was present. In all my practice I have seen but one case of pyorrhœa alveolaris where there was no deposit of tartar on the root. Judging from Dr. Howe's description, I should infer that he had classed as cases of pyorrhœa alveolaris those I do not regard as such,—recession of the gums and of the process, but no inflammation and no pus.



*Dr. Howe.*—Have you tested those cases with peroxide of hydrogen to see whether there was any reaction?

*Dr. Jarvie.*—No; but in a case upon which I have been working for the last two weeks the gums are just as hard as can be and quite free from inflammation or congestion, and yet on the superior cuspids the gums have receded one-half the length of the root, and there is not a particle of pus. It is simply a wasting away of the substance, and not only of gum tissue, but there is much erosion upon twelve of the upper and ten of the lower teeth,—that is, twenty-two teeth out of the thirty-one that were in the mouth. There is so much erosion that the pulps are almost exposed. I do not think, as a rule, that we find erosion and pyorrhœa affecting the same teeth.

*Dr. Perry.*—Would you call the case you have described one of pyorrhœa?

*Dr. Jarvie.*—No; but I thought that possibly Dr. Howe would class that as pyorrhœa. I do not find any serumic calculus in those cases, so that possibly we misunderstand each other by the terms we use. My mode of treatment has been almost identical with that described by Dr. Van Woert,—the removal of the deposit as much as possible, using pyrozone to wash out the pockets, following that with the use of trichloracetic acid. While I have not experimented with trichloracetic acid out of the mouth, I have in the mouth. In one case where my scalers seemed to make but little impression on the deposit, I bathed the tooth with the acid for one, two, or three minutes, and, while this alone did not take it off, it softened it so I could remove it much more easily. Unfortunately this deposit will not always locate where it is readily reached, and sometimes it will be in spots where it is almost impossible for any human being to remove it. I have seen one or two cases of pyorrhœa alveolaris that I considered absolute cures, but those were the only ones.

*Dr. Perry.*—Was the treatment the same?

*Dr. Jarvie.*—No; the cases occurred before I knew anything about pyrozone or trichloracetic acid. One was a case that I commenced about twelve years ago, and the other ten years. The treatment was simply the thorough removal of the deposits and the use of aromatic sulphuric acid. Undoubtedly there have been constitutional changes in the patient. I believe that the disease itself is largely due to constitutional tendencies. In nearly all the most obstinate cases we find that the patients have hard, dense teeth, as though there were an excess of lime about the

mouth, and the most valuable teeth are the ones that are lost by this disease. I cannot believe that the micro-organisms are the cause of this disease. I find they are an important factor in the spread of it. Where pockets are formed and places of lodgement for food are made you will have micro-organisms, and the disease will increase much more rapidly under that condition; therefore the necessity is still more urgent for antiseptic treatment. The pyrozone and the trichloroacetic acid will bring about a thorough antiseptic condition. You never will bring a case to anything like a satisfactory condition unless you have the full assistance of the patient, and, unfortunately, in many cases you do not get it. Often, after doing the best we are capable of, we see the patient after one or two weeks, only to be discouraged by the continued negligence and indifference manifested. The patients may say they have cleaned their teeth three or four times a day, while the fact remains that they have not *cleaned* them at all, although they may have brushed them. There is a vast difference, sometimes, between brushing and cleansing the teeth.

*Dr. Howe.*—Will Dr. Jarvie repeat what he said about erosion? I did not understand what erosion had to do with the condition of the absorbed border.

*Dr. Jarvie.*—I do not think it has any relation. I simply spoke of it. There was no deposit of lime in the case I mentioned, and no exudation of pus; and I spoke of the teeth being all eroded.

*Dr. Perry.*—I repeat that I do not mean that micro-organisms are the only cause of this trouble. I stated that I believed they are a very important factor. There must be a letting down of the vital forces. I believe that when they get an opportunity they are most powerful factors. Do not understand me as saying that germs begin the trouble, for I do not hold to that view. It is easy to be misunderstood, and this only shows how careful one ought to be in statement.

*Dr. Jarvie.*—Almost every speaker to-night, except myself, has said that he had never seen a case of pyorrhœa cured. That necessarily implies that none of the speakers has ever effected a cure. I wish we had some of the gentlemen here who have accomplished this, that they might tell us of their mode of treatment, for there are dentists who tell their patients that they can cure most of the cases, and some dentists in New York assert that in this age of skill and intelligence it is not necessary that any teeth should be lost through the ravages of this dread disease. I had hoped that we might have heard from such, and gained such wisdom and

knowledge from them that I at least might have so profited that I should no more see tooth after tooth, sound and free from decay, in the mouths of some patients, loosening slowly but surely, and patient and myself powerless to do aught but retard and not arrest the disease.

*Dr. Mitchell.*—I want to endorse what was said about dead bone. There is something so characteristic about dead bone that there is no mistake about it if it be present. I wished to speak of another matter, and that is that in those cases where we find quite an amount of absorption of the bone, without any appreciable absorption of the gum, we find pockets that are moderately deep, extending below where the union would be between the tooth and the periodontal membrane almost to the extremity of the roots. We find those pockets filled with a fluid of some kind that undoubtedly must have the power of breaking down the bone, melting it and consequently modifying the support of the tooth. That will give an acid reaction. The fact of its persistent presence there gradually but surely breaks down the bony support of the tooth. It need not be very much acidified to do so. It is a fluid that has a peculiar organization, and the capacity for producing a retrograde condition of the parts is most marked. I have had a number of those cases, and they were rather difficult to clear up. I find that something of a stimulating nature is the best thing to use. I have used carbolic acid and caustic potash, and also nitrate of silver, with very marked success. In regard to cases where we have a great deal of pus, I regard hydrogen peroxide as unreliable for the purpose of showing us true pus or giving us a true pus reaction. The reaction of peroxide of hydrogen is almost identical in fresh blood as with pus. I have tried it in a number of cases, and it is so similar that it is very difficult to observe any difference. Therefore if any statements were made in regard to its being a good indicator of pus they should be taken with some grains of allowance.

*Dr. Howe.*—Perhaps I ought to say that in using the term "pyorrhœa alveolaris," I do not apply it to that form of absorption of gum and alveolar borders which is evidently due to deposits of salivary calculus, but restrict it to those cases in which the alveolar borders are wasted so that pockets are formed of more or less depth, which tend constantly to increase and extend. There is not always a perceptible amount of pus present, but generally more or less makes its appearance if the gum is squeezed under the finger. If scales or granules of calculus are present on the root, the gum ordinarily has a congested appearance; but in those cases which

have no hard deposits on the root the gum is generally anæmic in appearance and looks shrunken where the alveolus is wasted beneath it. I think these distinctive appearances are generally, although not always, present in what I suppose is usually known as *pyorrhœa alveolaris*.

*Dr. Perry.*—Do you consider *pyorrhœa alveolaris* an inherited disease?

*Dr. Howe.*—Decidedly,—a disease that may be inherited and often is.

*The Chairman.*—Before we adjourn, I wish on behalf of the Society to thank Dr. Van Woert and those gentlemen who participated in the discussion this evening.

Adjourned.

JOHN I. HART, D.D.S.,  
*Editor New York Odontological Society.*

#### ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular monthly meeting of this Society was held at 1228 Walnut Street, Philadelphia, November 11, 1893, the President, Dr. E. T. Darby, in the chair.

The essayist of the evening, Dr. Bonwill, not having arrived at the conclusion of routine business, the President suggested that subject No. 10 of the series of questions be taken up,—“The Etiology of Pus Formation,”—and called on Dr. Truman to open the discussion.

#### DISCUSSION.

*Dr. Truman.*—The etiology of pus formation is by no means a settled question. The Waller-Conheim theory of the emigration of the white corpuscles of the blood is met by the school of Virchow, Von Recklinghausen, Stricker, etc., with the older theory, enunciated by the first named,—that of the retrograde metamorphosis of tissue,—and while the opinion of histologists leans towards the emigration theory, there is sufficient evidence to support the assertion that the origin of pus may be based on both processes.

The more recent and perhaps quite as important subject in this connection is the effect of pathogenic germs in the production of pus. It has been asserted that the formation of this is impossible without their active co-operation. To demonstrate their presence

in all centres of suppuration has been found surrounded with difficulty; in fact, there is ample evidence to prove that abscesses occur in which no germs are present.

It has been demonstrated by Miller and others that the air is not a very serious source of infection; and that it is not probable that micro-organisms reach the focus of inflammation through that medium in any considerable quantity.\* If this be true, it seems to leave but two sources of infection, direct contact with septic matter and through the circulation. While the possibility of centres of inflammation being produced through the blood needs no substantiation, it is equally true to say that all suppuration has not its origin from this source, or that abscesses are always produced through the blood. The results described by Peyrot, Kartoulis, and Laveran, in abscess of the liver, showing the absolute sterility of pus, indicates that at least the living organism is not always necessary in pus production. This is in a measure confirmed by Steinhaus, that ptomaines are "capable of producing suppuration without living organism." Janowski, Lemaire, Rosenbach, Grawitz and De Bary, and others have shown that chemical irritants will produce suppuration without the aid of micro-organisms. While this is disputed by others, their assertions, founded on experimental researches, have not been disproved.

It is probable that at the later stages of pus formation micro-organisms become active factors in its production. The minute lakes of pus found in pulps in a state of inflammation—pulpitis—must have their origin in immigration of the leucocytes, and cannot, I think, be ascribed to any retrograde process. To what extent this may be considered as the action of pyogenic germs has yet to be determined.

*Dr. Brubaker.*—In the formation of pus, the first element, apparently, has been overlooked. The formation of pus is, of course, simply one of the stages of inflammation, and inflammation is invariably preceded by a state of congestion, by which is meant a condition of paralysis of the walls of the smaller blood-vessels. As soon as there is this impaired circulation there is an aggregation of the white blood-corpuscles along the walls and the emigration into the surrounding tissue. With the cessation of the blood-flow there is at once an impairment in the nutrition of these tissues which leads to a lessening of their vitality. This is the first step, and which has been alluded to as retrograde change in the tissue-cells. The mere emigration of the white blood-corpuscles through the cells of the blood-vessels, carrying with them various germs,

would not in themselves give rise to the formation of pus. Germs in and of themselves cannot produce pus until there is impaired vitality of the tissues, which allows them to disintegrate the tissue molecules. Therefore I don't see how it is possible for pus to be formed anywhere in the body, except on the surface, unless you have the two factors, impaired vitality and presence of the germ. How the germ gets in the subcutaneous tissue to produce pus is, of course, a question, but I think they are absorbed by the white blood-corpuscles and are carried by them to the tissues, because they are constantly migrating.

At this point Dr. Bonwill arrived and read his paper on hypnotism.

(For Dr. Bonwill's paper, see page 21.)

#### DISCUSSION.

*Dr. Faught.*—I am sure we are all very much interested in this paper which Dr. Bonwill has read, but I feel quite confident he has only entered upon the very outside of the subject of hypnotism. Thirty-four pages would hardly cover a full treatment of the subject. I am quite disappointed in that he has only gone into its primary stage, that every one who has given any thought to the subject is familiar with. The concentration of thought in the patient, his idea of quietness and silence,—these things we find in almost every article written upon the subject.

I have written a treatment of one thought in connection with the subject, and if I clearly get you to see that one thought I shall have started you, I think, on the right road to the understanding of hypnotic influence.

The study of hypnotism, or of hypnotic suggestion, though fitfully pursued for many years, has only in the last two or three made any pretence to classification as a science. It is now being classed under the medical sciences. They, however, are positive in character, while it by nature is occult. In speaking, therefore, of such abstruse matters, there is often apparent disagreement when in reality the opinions advanced are in perfect harmony. This apparent disagreement is due to many causes, but the main reason of difference has at all times arisen from the attempt to define what in point of fact is undefinable, and is necessarily the outcome of the use of terms which are not susceptible of accurate definition. Hypnotism, being allied to spiritistic phenomena, requires that each student of it must for himself be the supreme judge of whether what is conveyed is or is not; for the principles govern-

ing the latter are involved in a primary study of the former. Everything proceeding from the invisible world has always come through human instrumentality, and has differed according to the conditions of the transmitting medium and those of the persons to whom directed. All such communications are therefore imperfect, and relative in value. Nevertheless, the unseen world is teeming with intelligences whose action upon this one is very direct, and is governed by laws, most of which are hidden from us; and those which are known are not comprehensible to the many.

With these introductory remarks and premises, I propose to confine myself to one point of study. I wish to explain to-night, if possible, how the hypnotic influence is conveyed from one person to another, apparently separated from each other. I wish to show that the separation is not as complete as appears to the observers, but that the individuals are in physical contact. For the purpose of this demonstration it is to be realized that our external senses are not tests upon which we can rely for anything, being organs for the transmission of sensations. It is an irrefutable axiom, that a thing is to the sense which perceives it what to that sense it seems to be. No one will deny that when they lay their hand upon a table or desk that there is actually no contact. What is true in the larger field is true in the lesser. No atom of matter in the hand is in contact with another atom, for each atom of matter everywhere is surrounded by what is called its "dynasphere,"—that is, a definite invisible circle manifesting perturbations derived from the energy of the atom. What is the constitution of this dynasphere can only now be inferred to be matter in still more minute atoms, even so finely divided as to be unseen by any known means. Their influence is felt though unseen. We are accustomed to this condition in every-day life, for science admits matter exists in gases and ether, in light, and in heat; indeed, nothing has yet been discovered of which it can be asserted that no matter is there. It must, therefore, be in the atomic dynaspheres themselves, and it is evident that we can conceive of no limit to it. The dynaspheres of atoms are in their turn surrounded by dynaspheres, and so on *ad infinitum*. This dynaspheric force is the agent of the phenomena of hypnotism, spiritism, and occultism generally. This physical thing is nothing more or less than what we have been in the habit of calling "spirit" when we wished to separate it from what is termed "ordinary matter." It energizes and does work in and upon "ordinary matter," and is a separate form of matter, infinitely refined and infinitely rapid in its vibrations. This dynaspheric force it is



which, passing from the organism of the operator by a continuous chain of matter in harmonious vibration, impinges upon the organism of the hypnotized patient and controls his will, his acts, and words. Here we have the secret of the attraction or repulsion we call love or hate, sympathy and antipathy, etc., which we produce upon our neighbors or they produce upon us. We but express the truth when we commonly say that we make or receive an impression. Scientifically speaking, all individuals in every-day life more or less hypnotize each other. To understand hypnotism we are therefore to clearly grasp the idea that physical, mental, moral, and emotional forces are all material. In this concept is a field of undreamt-of potency.

*Professor Newbold.*—I think I can hardly say anything directly relevant to the statements of the last speaker. It must be very evident to all of you that the theory which Dr. Faught has advanced involves not merely the phenomena of hypnotic suggestion, so called, but practically, we might say, the complete philosophy of life, here and hereafter as well. It seems to me also that the theory which he has advanced,—the spiritistic theory,—as an explanation of the phenomena of hypnotism, is possibly a little premature. I would not say that the facts we have are entirely inconsistent with it, but I would say that those who have most carefully studied hypnotism, and those who at present are best recognized as authorities, are not inclined to assume such an explanation. I don't like to use the word hypnotic force, as a force over and above the ordinarily recognized forces of physics and chemistry.

As to the points raised by Dr. Bonwill, it appears to me that the facts he presents all would be inclined to accept. It seems to me also, however, that we might differ with him very decidedly in the strong line of demarcation which he is inclined to draw between hypnotism as such and ordinary sleep and the phenomena of suggestion as distinguished from hypnotism, which he seems inclined to attribute to some personal magnetism proceeding from the operator. Without denying the existence of such magnetism, I think it is evident we must go as far as possible with the recognized facts and ordinary principles of psychology before we need to introduce any such new or hypothetical influence.

I do not deny that there are certain facts which are very well distinguished, which do indicate the necessity of assuming something analogous to thought induction, the possibility of one mind affecting another mind by some means other than the recognized forms of sense, but I think one would prefer for a long time to



refrain from formulating any defined theories to account for such facts. I think, first, we need careful, competent, and trained observers; very few are either careful, competent, or trained. We need to get the facts and place them beyond dispute. At present they are disputed by men for whose opinion we must have very great regard. Consequently you might say I stand to-night in a more or less sceptical position in relation to the theories and in a cautious position in relation to facts.

*Dr. Truman.*—We have Dr. Warren with us this evening. He has had considerable experience with hypnotism, and I should be glad to hear from him upon the subject.

*Dr. Warren.*—I have been more or less familiar with the phenomena of hypnotism all my active life. My father used it to some degree in his practice of medicine many years ago. Of late years I have employed it to a limited extent in my own practice. I would say with Dr. Faught, that I am disappointed in the paper presented this evening; I came with the expectation of hearing something more advanced,—something of a scientific nature presented to a body like this. While as a guest of the Society I appreciate the courtesy of the floor, I am frank to say that the essay was so elementary that I must decline to discuss it.

I will say this, however, of hypnotism, that I believe we can use it in our practice to a remarkable degree. I believe, too, that there is a great deal in the operator himself, and there is something more in it than suggestion; in fact, from personal experience, I have more than once laid the patients or subjects upon their backs in a profound sleep without speaking a word,—a mental suggestion, if you please. In practice, when a new patient presents himself or herself, I always endeavor to reach the mind and act upon it before operating upon the teeth. I think if we would all take that time with our patients to secure their confidence and then retain it, we would meet with more success in practice and help remove the fear and dread of the dental chair.

I might speak of one case occurring recently. A child—a young girl—who had never been in a dentist's chair was brought to me. While preparing for the operation and washing my hands I found the little one was crying, and the mother trying to get her to step up into the chair herself, or endeavoring to force her to do so. I asked the mother to step into the other room and make herself comfortable and leave the child to me. In a moment or two I had the little one's confidence, and proceeded to perform the operation, which was the insertion of three fillings, without a flinch or com-

plaint from the child, the work being thoroughly done. She told her mother that it was better than playing dolls; then seeing that the remark was rather amusing to us, she turned about and explained why she said it, which was that she was entirely at ease in the chair, and was interested in the work, but when she was playing house with the other children they had their troubles and quarrels.

That is simply one case, and shows that with a little care we can make the dental chair really comfortable.

*Dr. Truman.*—This subject is a profound one, and has claimed the attention of some of the best thinkers of the world.

From my earliest boyhood I have been interested in this and kindred topics, and this has not lessened as it has become a recognized subject for scientific investigation. It has, in all ages of the world's history, been the custom to repudiate unknown and startling statements, no matter however well supported, until they have received endorsement from recognized scientific bodies. Now, I believe that truth can originate from very lowly sources; in fact, I may go farther and say that the majority of truths that have eventually come to be recognized as such have had their origin in humble places, and not from the higher scientific circles of the period.

The prevailing idea that animal magnetism, mesmerism, hypnotism, for they are all synonymous terms, had their origin in the work of Frederick Anton Mesmer is an error. It was hoary with age before Mesmer was born. The other generally received opinion that Mesmer was a charlatan is equally erroneous. Those who are familiar with his history cannot truthfully denominate him as a quack. It is true he practised methods which at this day would be regarded as indefensible by correct thinkers, but in judging him the peculiar conditions of the period in which he worked must be taken into consideration, and also the fact that he really believed the modes adopted were necessary to the production of the magnetic sleep. The credit due to Mesmer, and it should be given him in full measure, was that he proved the existence of this power. The practical knowledge he possessed was doubtless received from Gassner, a priest of Switzerland, who effected cures by manipulation. Another idea in regard to Mesmer, that he was an uneducated man, is disproved by the fact that he graduated in medicine in Vienna, and for some time practised his profession.

Reichenbach fifty years ago demonstrated, after strictly scientific work continuing over five years, the existence of a force in the

human organism, which he named *odyle*. This *odylic* force or emanation could be observed in sensitive subjects. He did not attempt to give any explanation as to the origin of this, but if the result of his experiments can be accepted, he proved its presence in the human subject. When Professor Newbold claims that until we have exhausted all sources of explanation we have no right to assume the existence of a force analogous to electricity, he is not, I think, standing on tenable ground. The statement assumes that there has been no evidence adduced in this direction worthy of consideration. Has he made himself familiar with all the work of the past? I have no question but this has been done thoroughly with the means at command, but there are sources of information not always within the reach of those willing to work, and until these be sounded it is perhaps proper to take a non-committal position. The entire subject of occultism, in its practical and theoretical bearings, must be cultivated to understand this question in its general relations.

Personally my experience and study of the phenomena connected with hypnotism go back a half-century. It was somewhat of a family affair, as my father, in his medical practice, made much use of it in minor surgery, as the extraction of teeth.

During all this long period the mere idea of suggestion was not considered of vital importance. This was introduced in 1841 by James Braid, a surgeon of England, who denominated it *hypnotism*, or, more strictly, *neuro-hypnotism*, dropping the *neuro* subsequently. It was generally regarded as an unknown force inherent in the animal organism. Unless we accept Reichenbach's investigations, this has never been proved, but the evidence has been growing steadily through many decades that no other explanation will accord with the facts. I think the majority familiar practically with hypnotism will agree with me in the assertion that when passes are made from one individual to another, both the recipient and operator are conscious of an influence abnormal in character. I have personally felt this in marked degree traversing with electrical rapidity through the nerves, and at times producing almost local paralysis. This is not the result of suggestion. While it is true that mind can act readily on mind under proper conditions, I question its power as described by writers. I have repeatedly put persons to sleep, when in a highly nervous state, by making passes over the body and without touching the person. In one instance, in low, nervous fever, sleep was induced always by this process. This may be called suggestion; I prefer to regard it as induction

of a current of unknown properties, and producing an equilibrium in the disturbed nervous force of another.

Many experiments not necessary to mention here have demonstrated the existence of a force in the animal economy not as yet recognized by science. That the needle of the compass has been moved repeatedly without contact is a well-attested fact. The most recent, and, perhaps, as well supported as any other of this class of experiments, is that of Dr. Julian Ochorowicz, with a sensitive, in Italy, in which the needle made movements, hither and thither, of fifteen degrees, by simply bringing the hand of the sensitive near, but not touching, it. The galvanometer was not in the least effected. The theory of suggestion will not explain this phenomenon. The fact that the galvanometer was not disturbed disproves the electrical theory.

These and similar experiments, extended from the time of Reichenbach, have, I think, shown at least the possibility of a force differing from any known power.

There is yet much to be discovered; indeed, the little we do know is simply the outermost fringe of the psychical problems yet waiting solution.

*Professor Newbold.*—I desire to say a word or two in reference to my previous remarks, which Dr. Truman has probably not understood. I do not deny the existence of such a thing as any method of communication between two minds by means other than those ordinarily recognized, but I have never seen such facts as would point in that direction. I think it unfortunate to invoke any hypothesis to explain facts which can be explained by laws of phenomena which we do not understand. A very large part of the phenomena of suggestion and hypnotism, taking the two together, can be explained by perfectly well understood laws, or, if not perfectly well understood, at least prevailing principles and general laws. If there be facts which cannot be explained by well-known hypotheses, it will be time enough then to bring in others.

*Dr. Gilbert.*—The subject is of great interest to me, and my success in practice is due to the use of hypnotism, more especially with children, although with grown persons to a considerable extent. I have gone so far as to extract teeth without pain, the patient stating that to be the case. I now call to mind a case in which I extracted a molar where I told the patient that it would not be felt, and no pain would be incurred, and the patient said after the extraction that no pain had been suffered, although it was strongly and well fixed in the jaw.

As to the personal electricity, I find sometimes in operating that it proves very uncomfortable and annoying; so much so that the soles of my shoes would require dampening to avoid affecting the patient while undergoing treatment; they have expressed it as though a pin had been stuck into them. That, of course, was electricity.

*Dr. Bonwill.*—If there is any magic in hypnotism then there is magic in rapid respiration. Every one knows it to be a physiological fact that the amount of air passing into the lungs will produce an obtunding effect. I have learned it in experiments upon myself. You can destroy the sensibility to pain, but increase the sensibility to touch; experimenting on myself with chloroform led me to that discovery. I say to my patients, "Breathe rapidly; breathe as hard as you can; this will not destroy your sensibility to touch; you will see me and feel me, and it will be exaggerated."

I urge my patients to breathe very rapidly, at the same time talking to them and making suggestions. While hypnotism will affect only about forty per cent. of cases, rapid respiration will affect all. The suggestions and addresses should be in a loud and commanding tone, they must be markedly affected by a positive voice, as a general commands his army.

*Dr. Faught.*—I think Dr. Bonwill makes a mistake in regard to the commanding tones and loudness of speech. My idea of command is the power back of what is said, and not the way in which it is said. A command used in the most quiet tone would bring about obedience when it is known the power exists back of it to enforce it. It is not the law but the power behind the law which gives it the effect.

*Dr. Warren.*—I wish to endorse what Dr. Faught has just said. The suggestion need *not* be made in the form of a loud command, but on the contrary can be made in a very quiet tone. I have often sealed the eyes of subjects so that it was impossible for them to open them, simply by saying, quietly, "You cannot open them." Sometimes we will find among our subjects a nervous young girl, who, when she finds it to be impossible to open her eyes, will commence to struggle, and, if allowed, would go into hysterics; but by saying, in the same quiet manner, "Stop struggling and your eyes will come open," she will stop and the eyes open at once.

The element of danger has not been brought out this evening. I would like to say a word in regard to that. From my experience and observations I believe there is no danger whatever except what the operator ignorantly or foolishly makes of it, by giving suggestions that are dangerous. If the operator is an in-

telligent man or woman, always respecting the subject's feelings, there is no danger or unpleasantness whatever. In nearly all cases the subject must be entirely passive and willing; then you can control them very easily. Operators should always have special training and understand thoroughly how to handle the subjects when they are in the hypnotic state.

Dr. McQuillan proposed Dr. Theodore F. Chupein for honorary membership, and the meeting then adjourned.

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### CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

THE regular meeting of this Association was held May 15, 1893. The President introduced the essayist of the evening, Dr. D. M. Sabater, who read his paper on "Some Diseases of the Gums: Their Cause and Treatment."

(For Dr. Sabater's paper, see page 34.)

*The President.*—Gentlemen, you have heard the paper of the evening, and it is open for discussion. I regret to say that the three who were expected to have opened the discussion are prevented from being present,—Dr. Kingsley, Dr. Eaton, and Dr. Stockton. The meeting is open to every one, members of the Society and non-members.

#### DISCUSSION.

*Dr. R. Ottolengui.*—Mr. President, there is one trouble in the mouth that Dr. Sabater has not mentioned,—that is, hypertrophy of the pulp itself; and about all I have to say on that is that it is a curious fact that while in my earlier practice it was a common occurrence for me to see hypertrophied pulps, it is now a lesion rarely met with. They were usually found in molar teeth from which a large portion of the crown had been removed by caries. It could be observed as a bluish mass, and perhaps mistaken for epulis, but when removed it was found it was not this, but an hypertrophied growth of the pulp, produced by exposure, and filling the entire cavity of the tooth. I wonder why it is that I do not meet with these cases any more, while I used to see them so frequently. I have thought that perhaps it is explained by the fact that in my earlier days the practice with which I was associated

was largely among a different class of people; now I operate on a class that take more care of their teeth and give more attention to hygiene. I do not know positively that that is the reason, but I wonder whether it has anything to do with it.

Now, I want to say a word about gingivitis. I have among my patients a boy who has always had gingivitis since I have known him, except when he is under treatment. It will respond nicely to treatment, and he will recover, but when he remains away for a year or a year and a half he comes back with the same trouble. The last time he came to me I observed that the gingivitis was manifested principally on one side of the mouth, and I accused the boy of chewing mostly or altogether on the other side, and he admitted it. He did a little actual cleaning with the brush, and a good deal on that side of the mouth in eating. I wanted him to follow my instructions and chew on both sides of the mouth, but I knew he would not do it; he would say yes when I told him, and go home and follow the old habit. So I gave him specific instructions to get some chewing gum and chew it for ten minutes after every meal, on both sides of the mouth. That gave him a specific operation to perform, and his mind would be centred upon chewing on that side of the mouth; and it proved as I anticipated, it really made a change in that boy's teeth. He keeps up the gum-chewing.

Another thing about that: you have noticed in the advertisements of tutti frutti that it is said to be endorsed by the learned profession. I don't know who has endorsed it, but it is so stated. It seems to me that the chewing of gum as a constant habit is deleterious, whereas the abbreviated habit, as in the case I have cited, may have some advantage. The chewing of gum for five or ten minutes immediately after a meal excites the flow of saliva at the time it is needed by the digestive apparatus, and it may be beneficial; but it is reasonable to suppose that the salivary glands will only secrete a certain quantity of saliva, and if you make a constant drain upon them by the chewing of gum, there must be an excessive flow of saliva produced, and it necessarily becomes of an inferior quality, and of very little value as an aid to digestion.

I want to relate a case of pyorrhœa which I have not yet finished. The patient reported to me within ten days with an elongated lateral incisor, twisted and loosened, and I discovered a pocket on what you might call the posterior side of the tooth. As you probably all know, I have opposed openly the implantation or replantation of teeth in diseased territory, and it is because my experience has been that bone will not build over the labial

side of the teeth; for the reason that the process at that point is so thin. In this case the tooth was a great disfigurement, and I thought it might be possible to control the pyorrhœa until the tooth would become firm. I knew of no way of making the tooth go back to its original place. How that tooth became twisted is one of those things that look like a mystery, but I think the explanation is simple. The pyorrhœa loosens the tooth, and nature begins to eject it, it drops by gravitation, and as soon as this occurs it interferes with mastication, and the other teeth displace it. In all cases of protrusion of a single tooth you will find that the occlusion is at fault. The cuspid below was driving this tooth more and more to one side. I suggested to the lady, who was determined to retain the tooth, that it should be removed and replanted; and I explained the whole theory, and why I was willing to try it in this case; and that was that the pocket was at the side of the tooth where there is plenty of bone to cover it up. The tooth seemed to be attached at every part except that one. The patient consented, and I removed the tooth. I found the root covered from end to end with a deposit of serumal calculus. I could not scrape it off with a knife without using a great deal of force. I presume that it could have been removed by the trichloracetic acid which we have now. There was an attachment and deposit all around; there was no chance to make use of the scaler. The action of trichloracetic acid is not to destroy the deposit, but to destroy the attachment between the deposit and the tooth; it loosens it in a mass and it comes away. When I undertook to deepen that socket and reshape it, I found the bone carious, so that when that was removed the tooth would not stay in place; I could put it in any position I chose, but it would come away. So I said to the lady that the easiest thing to do with this tooth was to put it in the waste-basket and give it up; but this was not to me a satisfactory conclusion. I fitted a band on the tooth, and another on the adjacent tooth, put the tooth in, and took an impression in plaster, and then soldered the bands together, and cemented the lateral incisor into its band and let it get hard, then set my tooth, and cemented the other band around the central incisor. And here I want to tell you of a little trick upon which I place the utmost value, and to which more than anything else my success in that case has been due. In the first twenty-four hours after an implantation success or failure is determined. You want to avoid infection during the operation by the free use of bichloride of mercury; but would not infection after the operation be just as bad? and are we



not told that the mouth is full of bacteria all the time? Would it not be a nice thing to seal up or secure the margin of the gum to the tooth? That is almost exactly what I did. Immediately before dismissing the patient, after implanting the tooth, I cover the tooth and gum thoroughly with tannin and glycerin, leaving the mouth open for five minutes until a distinct coagulum is formed. In some cases I have known that coagulum to be attached to the tooth five or six or eight days afterwards. When the patient comes back it looks like a slough, but it is the coagulated blood, and it stands there as a guard to the entrance to that cavity, and practically seals it up. I treated this tooth in that way. There was a slight inflammation and a bluish discoloration of the gum. The tooth has been replaced now for five days, and there has not been a particle of pus formed; the coagulum is still there, the gum has formed a very pretty festoon, and it looks as though it would be successful. The patient asked me one day how I would decide whether it was successful or not, and I said by not being a failure. Then she said, "How do you decide it is not a failure?" I said, "Just as soon as you see pus you may know it is a failure." If she were to come to me to-morrow with a single drop of pus visible, I would take the whole thing out and then make a plate. The tooth is held firmly in place, and bone may build down around the root.

*The President.*—I would like to say that, in connection with the paper and the remarks of Dr. Ottolengui, the question was asked by the stenographer what acid he spoke of, and another gentleman who heard the question was not familiar with it. The acid spoken of was trichloracetic acid; and I want to emphasize the remarks of Dr. Sabater and Dr. Ottolengui in regard to that remedy. I have had an experience extending a little over two years in its use, my attention being called to it by a specialist in medicine, and its effect has been wonderfully good in my hands. I find it an invaluable remedy in connection with the removal of tartar where the scaler cannot be effectively used, and I would recommend it especially to those not familiar with it. It will cleanse a tooth and root of deposits of tartar where the scaler fails to detach it. It is not painful in its application, but is rather grateful to the tissues. It is somewhat of an escharotic, but there is an absence of serum after it has been used; it gives a dry surface. I have found it invaluable in the removal of the gum when it has grown over the edge of a cavity, placing the rubber band on before the operation. Sometimes when cutting away the gum in that way there is considerable loss of blood, but the application of trichloracetic acid will enable

you to remove it without hemorrhage. After the filling is completed, and examined a day or two subsequently, there will be found a healthy condition of the gum; the parts that were burned having sloughed off and healthy action taken place. I speak from personal experience with this remedy.

*Dr. Richards.*—How is the acid applied, and in what quantities? Is it by hypodermic injection or upon cotton forced into the pockets?

*Dr. Ottolengui.*—I think Dr. Van Woert's way of using it is the best, with an orange-wood stick,—making a skewer of orange wood, dipping it in the acid and putting it under the gum; in that way not carrying any more than is wanted.

Now, I want to ask a question, and I would like to have it answered. I would like to know how many gentlemen in the room have constantly in use in the office a spraying apparatus; I don't mean for spraying ether, but for spraying under the gum; how many of you have it? Practically nobody except Dr. Sabater. I bought a spraying apparatus six or seven years ago to spray ether, and I could not get along without one now. I have been a regular source of revenue to the druggists in my neighborhood by ordering spraying apparatus for all my patients. Many of my patients are now using them in the mouth for cleansing the teeth,—cleaning with a brush first and spraying afterwards. A spray will remove filth from the teeth that nothing else will. If you use a brush up and down, forward and back, something will remain that a spray will take out. And your operations in the mouth for gingivitis are not worth much without it. But if a spraying apparatus is recommended and in use every day, they will not need the constant attention of the dentist. I use a simple double-bulb atomizer. A good one is the cheapest; costs about four dollars. The principal thing that I use with it, if not the only thing, is hydronaphthol. If you have a patient with soft gums and with a generally filthy condition of the mouth, use a spray on them, and you will be amazed to see its effect. It may act like chewing gum; the patient with a spraying apparatus has a specific duty to perform, and is reminded of it and don't neglect it. Every one of you should get a spraying apparatus, and you will never be without it afterwards.

It has been suggested here that the use by patients of pumice-stone is bad. It is just as bad when the dentist makes use of it. When a corundum wheel is used the particles are forced up under the gum; this is readily removed by a spraying apparatus. I use a

spray more than I do a syringe. When cleaning the teeth of tartar, some pieces will get loose and lodge under the gum; the spray effectually removes them. The same result follows the use of pumice refuse. The patients like it.

*Dr. Iredell.*—In regard to whittling orange-wood for applying acid, I save time by using toothpicks made of orange-wood. I think you can procure about a thousand of them for five cents. They are flattened on one side and pointed the other. I find them a very excellent thing to use.

*Dr. Sabater.*—In regard to the use of a spray, I began to use this about two years ago by a mere chance. I had a case brought to me by a New York dentist, a man with a broken jaw, a right lower compound fracture of the ramus. It was in the summer-time, and a dental splint had been made for him. When he was brought to me I was astonished to find so fetid a breath and such a filthy condition of the mouth on the opposite side from the fracture. Dr. James E. Kelly, a surgeon of the Post-Graduate Hospital, suggested the spray, and it was used in that case. Under his direction I purchased one and used it on this man every other day; he could not come every day, he was working. In the course of nine days I used it four or five times, and I was astonished to see at the end of that time the healthy change in the mouth that was originally in such a very bad condition. I have used a spray also in some cases of necrosis, using peroxide of hydrogen as a medicament. In cleaning teeth I have used it a little, through the advice of Abbott. He said, if I would use it in every case after cleaning, and especially in bad cases, I would find better results than if I were to take all the teeth out and clean them and put them back again; and I think that is so. If we use powder, a portion of the substance is left between the teeth and in the festoons of the gum, and in twenty-four hours you will find the gum highly abraided and hypertrophied; but a spray will wash all that out. Every one of you use it and you will be glad of it.

## Editorial.

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### THE OPENING YEAR.

Good resolutions and the ordinary platitudes are indulged in every New Year with an honest prolixity that seems to argue for good not only to the individual, but for society in general. While every good resolution has in it the germs of an incentive to a higher life, and may lead in that direction, it is, unfortunately, too true that in the majority of cases they are written upon the sands of time, to be obliterated by each recurring wave of the world's ever-changing life.

While this is true, the daily and yearly inspiration given is a good one. It is typical of that inner aspiration that is ever looking towards progress, and through its impelling influence civilization advances, professions develop, and man takes the measure of his own abilities and capabilities of meeting the ever-increasing demands of his age.

The New Year is a period—a very brief one, as time is measured, but an appropriate one to moralize, to review the past and build for the future.

The years are not many since the first man essayed the dental art on American soil. More than a century has flown by, but centuries are mere periods, dots on the pages of a world's history; yet this short lapse of time means much to our profession. In that period it has developed beyond the expectations of those who bravely attempted its earliest work. To-day it is recognized as one of the important aids in the amelioration of human ills.

Retrospection is not always profitable, for it brings with it the reflection that however good the work may have been, its imperfections stand out in bold relief, bringing the sense with it of crude manipulations if not positive ignorance. It is probably true that no one who has practised our profession for fifty years but has felt humiliated by his experience. It has been a structure builded upon mistakes, necessarily so, for it was an attempt to form a conception from fractional experiences in many directions. It was an effort to graft mechanical ideas upon medical practice, to make a unique profession, combining the old theories with new ideas. That this met with opposition is not surprising. The old professions treated

the new aspirant with contempt. It was regarded as a trade; the assumption of professional equality was looked upon as a feeble effort to elevate it above pure empiricism. This feeling was the natural antagonism of conservatism and had its period, to give place to a more enlarged conception of the value of this labor.

It has taken more than a century to reach the present standard, and it will cover more than the same period to crown the work thus far accomplished. We have no reason for self-complacency. The past has developed much, but we are very far removed from the time when the eighteen thousand men in this country can be called a thoroughly trained body of dentists imbued with the recognized professional spirit, without which a profession cannot exist.

The New Year of 1894 brings with it the impressive fact that in six years the century will have closed its work, the deeds, good and bad, will have passed into history, and the new era of a twentieth century will have begun its record. We cannot deal with it. That it will be a period of wonderful progress, who can doubt? Science, art, and a profounder knowledge of things material will, doubtless, make that century, to those who live through it, more remarkable than any that have preceded it.

We glory in our own century. It has advanced the world's knowledge as no other. The social, material, and spiritual life of the nations has developed beyond all former eras, and as its last years are fleeting by we may feel that, with all its deficiencies, its record will remain as the most brilliant epoch in history.

As a profession we cannot count by centuries, but must look to the passing years for marks of progress. If these have not shown an educating force in developing a better professional life, then may we well despair. We need much. To rest satisfied with our educational facilities, with our standards, preliminary and collegiate, augurs but poorly for advancement. There are no stopping-places in a profession. It is trite to say that a permanent camp means stagnation, yet it embodies a truth which cannot be too often repeated. The various agencies that have strengthened professional work must be used with more power. The indifference must give place to increased activity, and activity should demonstrate its value by results. Each and every one should take part in associative efforts. The load of inertia now carried must give place to an ever-increasing interest. The selfish side of life should change to the better altruistic conception that the labor of each is necessary to make the perfect whole.

Let, then, the New Year open with a resolve that laggardism shall cease; that the profession, like a man's country, needs the labor, voice, and pen of every individual in it, and that this should be given to the extent of ability, without reserve and with enthusiasm. If this resolution be inscribed in indelible characters upon the life of each individual, then the New Year will prove better than preceding ones, and each in its turn will add lustre to the professional life of the century.

### DIPLOMAS IN ABSENTIA STILL IN DEMAND.

THE following letter, with translation, indicates that the demand for diplomas in Germany has not ceased. These applications, while not as frequent as formerly, still demonstrate that the fraudulent diploma is still circulated, and must have a certain value to the recipient.

We publish this not on account of its rarity, but to call the attention of the State Board of Examiners of Wisconsin to the fact stated in the letter. The "Wisconsin Dental College" has been something of a myth for a number of years, and it would gratify many to have its history and work explained.

[*Vertraulich*!]

18 November, 1898.

JAMES TRUMAN, DEAN OF THE UNIVERSITY OF PENNSYLVANIA, DEPARTMENT OF DENTISTRY, 8243 Chestnut Street, Philadelphia:

HOCHGEHRETER HERR PROFESSOR,—Frage hiermit ergebenst bei Ihnen an, ob Sie mir nicht das Diplom Ihres geschätzten College verleihen wollen.

Ich bin im Jahre 1889 von dem Wisconsin Dental College reputable als Doctor of Dental Surgery diplomirt und bin zur Einsendung jeder Examen Arbeit bereit. Wegen meiner Familie ist es mir nicht möglich nochmals hinüber zu kommen, und bitte ich Sie daher mir Ihre Bedingungen gefälligst *baldigst* mitzutheilen.

Im Voraus meinen verbindlichsten Dank, begrüße ich Sie unter der Versicherung strengster Discretion.

TRANSLATION.

[*Confidential*.]

November 18, 1898.

JAMES TRUMAN, DEAN OF THE UNIVERSITY OF PENNSYLVANIA:

HIGHLY HONORED PROFESSOR,—I ask you whether you will be willing to invest me with the diploma of your greatly esteemed college.

I received the regular diploma of D.D.S. from the Wisconsin Dental College in 1889, and am ready to send in to you any examination work that you may request.

On account of my family it is impossible for me to cross the ocean again, and I beg you to send me the terms as quickly as possible.

I return in advance my thanks and salute you under the assurance of great discretion.

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## TWO GOOD PAPERS.

It is not our custom to call special attention to papers published in this journal, but we fear that oftentimes our readers lay the numbers, as they appear, aside, for the leisure to read certain articles, but this period never comes, and the good things contained herein are lost.

We therefore hope that no one will defer reading two of the articles in this number, the one—Professor Peirce's paper—for its possible scientific value and generally excellent and altogether interesting statement of supposed facts connected with a rather over-written subject. The other on "Specialism," by Rev. Reuben Thomas, is an address worthy of careful perusal. The genial tone and scholarly thought pervading it gives to it a value not only to our profession but to all workers in narrow scientific fields. Its broad catholic spirit is refreshing in these days of scientific platitudes and profound dulness, the necessary outgrowth of a limitation of vision.

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## REGISTERING DIPLOMAS IN PENNSYLVANIA.

**MANY** complaints have been received in regard to the inequality of charges made by the recorders of different counties for registration, these ranging from one to three dollars.

As far as known, the law does not regulate this, and it is presumed no power exists to make the fees equal throughout the State. It would seem to be the duty of the State Board to remedy this injustice by proposing an amendment to the law, if that be the best way of reaching the difficulty.

## Bibliography.

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**NOTES ON ANÆSTHETICS IN DENTAL SURGERY.** By Arthur S. Underwood, M.R.C.S., L.D.S., England, Professor of Dental Surgery, King's College Hospital, etc., and C. Carter Braine, F.R.C.S., Anæsthetist and Instructor in Anæsthetics at Charing Cross Hospital, etc. Second Edition. Claudius Ash & Sons, Limited. London, 1893.

This is the second edition of a very valuable and practical book. It embraces in its one hundred and fifty-five pages the main facts with which it is necessary the young operator should become familiar. These are stated so clearly that no difficulty should be experienced in comprehending the processes detailed.

The author has very wisely not depended entirely upon his own judgment, but has called to his aid specialists in anæsthetics.

The chapters on ether and chloroform in this edition have been entirely rewritten.

The book opens with a short history of anæsthetics, followed by six additional chapters on "General Considerations, etc.," "Nitrous Oxide," "Use of Air with Nitrous Oxide," "Ether," "Chloroform," and "Physiology of Anæsthesia."

The inexperienced operator will find the sub-chapter on "Minor Precautions" to be of special value.

In prolonged operations the use of ether is recommended following the administration of nitrous oxide. The author states that, "in such cases a few respirations of ether administered when the patient is under gas prolongs the anæsthesia, and so small an amount of ether is used that the patient is not aware that he has inhaled anything but nitrous oxide." Then follows a detailed description of the mode of administration.

The use of air in connection with nitrous oxide is described by George Rowell, F.R.C.S., and, after detailing various modes to admit air, says, "The plan which I have adopted is to occasionally interpose a complete breath of air between the breaths of gas by turning the stop-cock of a Hewitt's gas apparatus off and on again before and after an inspiration. . . . When air has thus been carefully given, the resulting anæsthesia is practically as deep and as good



when nitrous oxide alone is employed, and I believe always strengthened."

The chapter on the "Physiology of Anæsthesia" seems worthy of special attention throughout, and especially the closing paragraphs on the danger of shock where many teeth are extracted at one sitting. The theory is that irritation of the fifth pair of nerves is especially liable to be followed by this condition.

We can recommend this book as a safe guide and a valuable work of reference.

**SURGERY.** A Manual for Students and Practitioners. By Bern B. Gallaudet, M.D., Demonstrator of Anatomy and Clinical Lecturer on Surgery, College of Physicians and Surgeons, New York, etc., and Charles N. Dixon Jones, B.S., M.D. Lea Brothers & Company, Philadelphia.

This book of two hundred and ninety-six pages is another of that excellent series of manuals published by Lea Brothers & Co., the care with which these have been prepared is continued in this, and it is satisfactory in the general statements and description of surgical procedures. A considerable portion has been devoted properly to the difficult subject of inflammation. The author has been successful in arranging this to meet the comprehension of the dullest student. His explanation that the exciting cause of inflammation . . . is bacteria may be questioned, in view of the fact that certain inflammations have been demonstrated to have been produced without the agency of micro-organisms. It is doubtful whether dogmatic assertions on this point can be indulged in at this period of the investigations.

This book, as also the others of the series, are valuable as reference manuals, and will, probably be made use of in this direction quite as much as for that for which they were originally intended.

**CHEMISTRY AND PHYSICS.** A Manual for Students and Practitioners. By Joseph Struthers, Ph.B., D. W. Ward, Ph.B., and Charles H. Willmarth, M.S. Edited by Bern B. Gallaudet, M.D. Lea Brothers & Co., Philadelphia.

The series of manuals for students of medicine, published by Lea Brothers & Co., have a well-deserved reputation for the care taken to have each of them regarded as an authority upon the special subject treated.

This the twelfth of the series is of a superior character. The matter is carefully arranged in the form of questions, and the an-

swers given are so tersely stated that they cannot fail to carry with them a clear comprehension of the subject. This must be the impression left upon the mind of reader and student, upon an examination of the admirably-prepared contents of this volume.

The difficulty with students at the commencement of any intricate study is to know how to separate essentials from non-essentials. To accomplish this there is nothing better than the question and answer method, providing these are prepared by practical men.

This book gives evidence of this care, and the fact that three teachers, prominent in their several branches, have labored together in its arrangement is a guarantee for thoroughness in the work and freedom from error.

**ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES.** A Yearly Report of the Progress of the General Sanitary Sciences throughout the World. Edited by Charles E. Sajous, M.D., and Seventy Associate Editors, assisted by over Two Hundred Corresponding Editors, etc. Illustrated. The F. A. Davis Company, Publishers, Philadelphia, New York, Chicago, and London, 1893.

The sixth issue of this annual is again presented to the medical reading world with a promptness and completeness worthy of the highest praise.

Every issue has been an improvement on those preceding, and this is no exception; indeed, it seems to have nearly reached a culminating point in the particular line of work mapped out for the editors and collaborators. The removal of the editor-in-chief, Dr. Sajous, to Paris, led to the thought that perhaps it might not show that care previously presented, but this is, happily, not the case; indeed, it seems to have given it a broader and strictly more of an international character.

The following eminent names have been added to the active list of contributors, and increases the value of this as it must that of succeeding issues. Among these are Dujardin-Beaumetz, Benjamin Ward Richardson, Lépine, Obersteiner, Bourneville, Kerr, Lutaud, Budin, Buxton, Levison, Apostoli, and Poirier.

The amount of labor represented in these five volumes, containing in brief the yearly work of the world in medical science, is simply enormous, and the wonder is how it could have been accomplished in the limited period of a year. It is the one work of the kind in the world, and it is not, therefore, remarkable that it is fully appreciated wherever it has become known.

## Notes and Comments.<sup>1</sup>

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**EXCELLENCE.**—The end and aim of human life is manly excellence. That consists in development of body and spirit; all else is means; the formation of a manly character is the end. He makes the most of life here who becomes most of a man, does the most of human duties, and so has the largest quantity and highest quality of manhood.

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**STIMULANTS AND HEMORRHAGE.**—Never give stimulants in a case of severe hemorrhage. The faint feeling or irresistible inclination to lie down is nature's own method of circumventing the danger by quieting the circulation and lessening the expulsive force of the heart, thus favoring the formation of clot at the site of injury.—*Minique.*

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**HOW TO REST.**—"To understand the way to rest is of more importance than to know how to work. The latter can be learned easily; the former it takes years to learn, and some people never learn the art of resting. It is simply a change of scenes and activities. Loafing may not be resting. Sitting down for days with nothing to do is not restful. A change is needed to bring into play a different set of faculties, and to turn the life into a new channel. The man who works hard finds his best rest in playing hard. The man who is burdened with care finds relief in something that is active, yet free from responsibility. Above all, keep good-natured, and don't abuse your best friend, the stomach."

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**PROFESSIONAL FEES.**—Almost the first question a young practitioner asks is, "What shall I charge?" "What do you charge?" These two questions many times have caused him years of sorrow and hopeless longing for the clientele that never comes.

If he had commenced with the idea of doing a great deal of work

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<sup>1</sup> The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

for a little money, his skill would have increased, his experience enlarged, his reputation spread. Patients would have flocked to him as to the one person whom they would permit to fill their teeth, and then, independent of the whims and idiosyncrasies of the few, he could have charged fair prices with a feeling of security in the rapid development of his reputation and the enlargement of his bank account.—*Dr. Truman.*

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## Current News.

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### DR. JESSE C. GREEN HONORED.

In commemoration of his fiftieth anniversary in the practice of dentistry, a banquet was tendered to Dr. Jesse Cope Green at the Union League of Philadelphia, November 4, 1893.

After the dinner, Dr. Alonzo Boice, the toast-master, and president of the Philadelphia County Dental Society, spoke of the part the Society had taken in bringing together so many representative members of the profession to pay tribute to the honored friend and guest. In introducing the first speaker of the evening, Dr. Boice said, "I notice a brother who has practised not fifty years, but forty-two years; every one in this company knows him personally. He has been identified with all the dental societies throughout the United States. He has been, and is, an original investigator, author, and teacher, placing him in the front ranks of literature and science. I refer to Professor C. N. Peirce."

Dr. Peirce spoke in part as follows:

"MR. CHAIRMAN AND FRIENDS,—I esteem it a great privilege that I should have been invited to speak to you this evening of our honored guest, one who has for a half-century served the public, giving position and prominence to his profession, to our profession, and made a place for himself in the hearts of his associates and friends—a position which renders his advancing years not irksome, but delightful, giving weight to his discourses, and so personifies integrity that in the richness of his life the man stands before you without a shadow to obscure the inmost throbbings of his heart.

"The consciousness of a life well spent and the recollections of virtuous actions, he will tell you, far exceed stocks and bonds as a

paying investment at any age. Nobility and dignity such as his, refined by courtesy, cannot be changed by increasing years.

"It matters not whether the position our beloved friend has filled and is filling be civil, professional, or domestic, the duties performed are for the benefit of the patient, the people, or the family; self has always been subordinated to the interest of those being served. You ask me why our friend is so happy and so young, yet so long in life? I answer, he does not climb the mast or run up and down the decks as do the boys, but at the helm he sits and, holding it firmly, guides the ship clear of the rocks and in the current holds her steady, doing not those things that the young do, but greater, better things.

"Let us now for a moment lift the veil and read a little from our honored friend's private record; in doing so we shall see that he was wise in recognizing that the skill to do comes of doing, and that knowledge comes by opportunities embraced, with eyes always open and, working, willing hands ever ready when and where they could be helpful."

The speaker here reviewed the long and valuable services of Dr. Green not only in his profession, but in scientific and literary lines. He spoke, too, of the doctor's friendship with such men as Wendell Phillips and George William Curtis, with Whittier, Emerson, Lowell, and Longfellow, and in closing addressed the guest as follows:

"This evening, my dear friend, our honored guest, we are all here to greet you, give you our hearts untouched by jealousy, our souls unmoved by rivalry. We cry out to you with one voice, God bless you and be with you on your happy way."

The Chairman next introduced Dr. Green as "Our Honored Guest." The doctor in responding spoke as follows:

"Friends, as I call you all in my own language, I want you all to accept my most sincere and grateful thanks for what I have experienced and felt this evening, and while I do not expect to make a speech, as our friend, I thank him for all he has said, but still feel that his picture has been overdrawn.

"I am glad to see around this table many friends whom I have long known, and to experience the sociability we feel here to-night. I commenced the practice of dentistry when there was no such thing." The doctor then dwelt at some length upon the condition and position of dentistry a half-century ago, and of its evolution up to the present time. He spoke particularly of the advances made in dental education, of the remarkable strides in dental journalism, of the introduction of anæsthetics, etc., and closed with

these modest and characteristic remarks: "When first spoken to concerning this banquet, I said it was not my nature to take a prominent place, but the question arose in my mind, Can I refuse it if by so doing it would be of use to some one or add to the pleasure of others? The great aim of life should be to benefit the people by our existence. In closing, I can certainly say that at the present time I am enjoying a 'Green' old age."

The toast-master then called upon Professor E. T. Darby, who in response said,—

"I always think of Dr. Green as about my own age, though I believe he began the practice of dentistry before I was born. I think of him as I think of Oliver Wendell Holmes, who once said that he was seventy-five years young, not seventy-five years old.

"It was twenty-eight years ago last June since I first met Dr. Green. He has from that day to this been my friend. There is no man in the profession I respect more. I have been in his shop many times, and it is one of the most interesting of places. Some of the most pleasant and instructive conversations I have ever had have been in that den of his. I look back upon our friendship as one of my most pleasant recollections. Wherever the dental profession is known, wherever Dr. Green's name is known, he is loved and respected, honored by all."

The Hon. J. Russell Young, President of the League, then made an appropriate and pleasing address. He expressed himself as being happy to join in doing honor to the modest, useful, and meritorious life of the venerable guest. He spoke further of the many noted people who had been entertained at the League, but none, he said, were more thoroughly welcome than Dr. Jesse Green.

Other toasts were responded to by Professors Wilbur F. Litch and Henry Leffmann, and Drs. E. K. Sanger, President of the Central Dental Association of New Jersey, F. L. Bassett, President of the Pennsylvania State Dental Society, E. M. Beesley, President of the New Jersey State Dental Society, L. A. Faught, of the Pennsylvania State Examining Board, and others.

Numerous letters and telegrams were also received, one from far-off California, sending congratulations and good cheer to Dr. Green.

G. W. W.



# THE International Dental Journal.

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No. 2.

## Original Communications.<sup>1</sup>

### INJURIOUS EFFECTS OF AMALGAM FILLINGS.<sup>2</sup>

BY CHARLES H. TAFT, A.B., D.M.D., CHICAGO.<sup>3</sup>

MR. PRESIDENT AND BRETHREN OF THE HARVARD ODONTOLOGICAL SOCIETY,—The invitation to present for your consideration the paper which I had prepared to be read before the Massachusetts Dental Society, upon the invitation of the Secretary to send the Society something for its twenty-eighth annual meeting, and which, as is generally known, was refused a hearing for reasons too puerile to mention here, is especially gratifying to me,—the more so because the invitation comes to me entirely unsolicited, and proves that there is one society at least that is always willing to hear and to discuss anything that claims to be of scientific interest to any member of our profession.

Knowing as I do full well that the possession of convictions is never considered by Harvard men a sin or a crime, and that a man can always be entitled to respect and sincerity of purpose who has the courage to express them, however much others may differ with him, I come to the subject of my paper, and shall explain to the

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<sup>2</sup> Read before Harvard Odontological Society, September 28, 1893.

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best of my ability the reasons why amalgam fillings are often, though not always, a source of evil, considering the subject almost exclusively from the stand-point of those who practise medicine in strict accordance with the teachings of Hahnemann.

That I may not lay myself open to the charge of making dogmatic assertions which rest upon no logical or scientific foundation, permit me to say in the beginning, that no one in the past has been a greater sceptic as to the assertion that amalgam fillings could offer any obstacle to the physician in the treatment of disease than myself. No one, probably, has used amalgam with greater freedom than I have done, or had greater faith and confidence in the efficacy of copper amalgam above all others as the best possible substance to be used in a large percentage of cases, both for the hardening of tooth-substance and the prevention of further decay.

I still hold to my faith in the fact that we have yet to find a substance or material that will better preserve tooth-substance and bone-tissue than pure copper, and I think this fact will be abundantly verified to the satisfaction of any one who will examine the teeth, the bones and crania in many of the skeletons of the ancient tribes of Indians to be found in the Peabody Museum of Archaeology and Ethnology at Cambridge. In addition to such verification, we have the results of clinical experience to prove the value of copper as a filling-material.

When, therefore, I make the statement that, earnest as is my desire to save the teeth of my patients, I hesitate to do it with any material which may prove an obstacle to the physician subsequently in the treatment of disease,—however much I may value it as a filling-material,—and that I have discarded the use of amalgam absolutely during the past year of my practice, it may reasonably be assumed that I have taken the trouble to investigate for myself whether the statements of physicians upon the point at issue are correct or not, rather than ridiculing and trying to laugh them away.

What, then, is it that exerts an injurious influence upon the system and proves the obstruction to the proper action of a carefully selected and indicated remedy in the treatment of disease?

That it is the mercury alone which is used to effect an amalgamation of one or more metals in a finely-divided state physicians of both the two great schools of medicine are all agreed: and the claim is therefore often made—more especially by the homœopathic physician—that the indicated remedy given for any diseased condition or disturbance of the vital force often fails in its curative



effect when there is apparently no good reason in view for its so doing.

Now, the physician who practises medicine in strict accordance with the teachings of Hahnemann knows that every disease, be it acute or chronic, should yield sooner or later to the action of the one and only one right remedy; and knows still further that no two medicines when mixed together can act in harmony in restoring to the vital force its normal equilibrium any more than two plants growing side by side in the same soil could become associated together without discord,—that is to say, every drug or medicine has a distinct individuality by means of which it alone is capable of successfully attacking a given set of symptoms and restoring the natural harmony among the organs and tissues of any part of the system in which such harmony has been disturbed.

It will be seen, therefore, and can be proven by any one who questions this fact, that the action of an indicated medicine or drug will be only partially successful at times in its curative action, for the reason that there is another drug which is counteracting the effects of the prescribed remedy. In other words, the patient being one who is peculiarly susceptible to mercury is continually getting what are termed *proving*s of the drug, and the physician derives about as much satisfaction in the treatment and cure of his patient as does the one whose practice it is to give one or more remedies in alternation, believing that if one does not do the work, the other or both in combination may.

The physician accordingly instructs his patient to go to the dentist and have the fillings removed. The patient, valuing his health, obeys in spite of the assurance generally given that it is all hush, humbug, or nonsense to rely upon such advice.

What is the result of their removal? Chronic diseases which have hitherto failed to yield to treatment begin at once to yield more quickly and permanently to the action of the medicines. The patient is quick to perceive the improvement in his general health, likewise the family and friends. The action of each new drug which is prescribed as the character of the symptoms change advances the patient steadily on to renewed health instead of having but a temporary effect for the better, only to allow him to slide back to where he originally was, as was the case before the amalgams were removed.

Circumstances and associations the past year have been such as to compel me to investigate for myself, and to frankly acknowledge, as I have not been able to do hitherto, that a marked improvement

in the patient's condition almost invariably followed the removal of the amalgams, and that the action of the medicines upon the disturbed vital force was much more marked and effectual following such removal than what it was before.

How, then, it may be asked, do you account for the very frequent desired action of the indicated remedy in the treatment of a patient whose teeth *have* one or more amalgams, while in the treatment of other patients whose teeth are similarly filled the indicated remedy fails? And this brings us to the point I wish to emphasize,—namely, that all persons are not susceptible to the same drugs at all times nor in the same degree,—that is to say, one person may have only to smell of a bottle containing phosphorus, for instance, in the one hundred thousandth or a much higher potency even to get well-marked phosphorus symptoms or provings so called, whereas another person might smell of the bottle all day long without perceiving the slightest ill effect.

Again, one person sleeps for a night in a room the wall-paper of which contains arsenic and gets well-marked symptoms of arsenical poisoning, while another person may sleep in such a room for an indefinite period without perceiving the slightest effect.

Still again, one person passes through or near a bed of poison-ivy with perfect impunity, while another shows soon afterwards unmistakable evidence of ivy-poisoning.

In neither of the above instances is there any of the crude material of the drug taken into the system, and yet no one will deny that there is an altered or perverted condition of the vital force, with symptoms produced by each which could not possibly be mistaken for, or confounded with, those of any other drug.

If it is clear, then, that in neither case is there any of the crude substance to produce the given symptoms, but that the symptoms unmistakably exist, we must face the question, What is it that produces them in either case? and this brings us to the question, What is the vital force, that unseen and intangible something that constitutes the difference between a live man and a dead man? Is it a material substance that can be seen with the eye or felt with the hand? If not, what else can it be but a spirit-like force or substance (as Hahnemann terms it), and which, when becoming disturbed by disease, must be treated with a similar dynamic force rather than with a crude material one?

When we come to reflect and to appreciate the fact that it is this vital force and not the material organs or tissues of the body upon which the action of medicines is to be directed; when we

have, too, the fact visibly demonstrated to us that a force which can neither be seen, felt, tasted, or smelt, like that which I have just mentioned, and apparently dormant, can so affect the vital force of a person who is peculiarly susceptible to it as to be manifested in plainly-marked symptoms peculiar to that drug and that alone, then we can discard the idea as worthless that because there is apparently no free mercury in an amalgam filling there can consequently be no dynamic effect to retard the action of any drug which the physician finds it necessary to prescribe.

Whenever we deal with potentized drugs of any kind, so far as their medicinal properties are concerned, we are dealing with forces as subtle and powerful as any of the natural or physical forces which govern the universe.

What matters it how small or in what form the substance exists provided its force, apparently dormant or inert, is unmistakably manifest?

An esteemed member of our profession across the Atlantic has declared that his complete abandonment of high attenuations dates from the time when he discovered that he must either give up this method of treatment or avow his disbelief in the atomic and molecular theories of chemistry. Has any one ever seen a molecule of any material substance? Has any one ever been able to prove that when a molecule has been divided and subdivided for an infinite number of times there has been a limit reached to its further subdivision?

We may search as hard to find with the highest powers of the microscope a single molecule of the material substance of aconite and of many other drugs in the third decimal potency as we may to find one in the forty-five thousandth potency, and yet the *fact* remains that well-marked and distinctive symptoms peculiar to that drug can be derived as well from one as from the other potency when administered to a person in perfect health and who is peculiarly susceptible to aconite.

In the study of embryology and zoölogy the microscope has given us visible demonstration of the fact that all life is cell-life, and that such life is manifested in many of the lowest forms of the vegetable and animal kingdoms by the existence of but a single cell. Conversely, the study of pathological anatomy, which is but a manifestation of perverted life, or what we call disease, has taught us that all disease is cell-disease. The human body being made up of multitudes of cells, and millions upon millions of them so minute as to be well-nigh invisible with the highest powers of the micro-

scope, it is clear that a medicine in order to reach and affect them must be equally minute, for in order to reach them it must enter them, and to accomplish this it must be smaller than they.

A well-known writer has said that "Food, to be appropriated by the body, must go to the stomach and be digested, pass from the stomach and be assimilated; but that medicine, to be effectual, should not travel this route. Digestion would destroy it. It should be so minutely divided that the open-mouthed absorbents swallow it as soon as it comes in contact with the mucous membrane of the mouth. Thus unchanged it enters the circulation.

"A group of cells in a remote corner of the anatomy are hurt and crying out for help. Help is on the road. Over the trunk-lines, past the way-stations, out on the local road, recognized by every road official *en route*, and hurried unerringly to its destination. No need then of further concern or anxiety. If the doctor has selected well, the drug will reach its destination.

"We may not be able to locate the origin of, or always diagnose, disease to our entire satisfaction, but this need not, does not, prevent intelligent and successful treatment of the sick. Every disease or condition of disease will photograph its appropriate remedy, and every remedy true to the picture will accomplish the object designed. In the midst of doubt and uncertainty regarding exact pathological conditions, we can at least be sure that disease is not an entity; that it cannot be expelled by emetics, cathartics, diuretics, or diaphoretics; that it is wrong life, perverted life, inharmonious, discordant life; and that, while it may be coaxed back into tune and harmony, it will not, cannot, be coerced."

The subject at issue has to deal so closely with the dynamic influence of drugs that I find it difficult to attempt to express myself clearly to those who do not fully understand the meaning of the term and manner in which this spirit-like force (the real medicinal property) of the drug, as Hahnemann terms it, is evolved or set free when the drug is potentized or dynamized.

To all such persons I would suggest that a careful perusal of one of Hahnemann's works, entitled "The Organon, or Art of Healing," will throw much light on many things in my paper which may otherwise seem very obscure.

It is a well-known fact that every drug is capable of producing well-marked symptoms which are characteristic of it when administered either in the highest or lowest potencies to persons in health.

Let all who are inclined to doubt this statement take the trouble

verify it by actual experiment instead of prematurely ridiculing as many no doubt will be inclined to do, for I do not expect anyone to accept the truth of any statement I may make upon my own *ipse dixit*, or with that "happy blind faith of childhood" which some of my friends across the water declare they no longer possess. When we have proved this to our satisfaction we can then accept the fact that because the mercury has entered into the formation of a chemical compound it has none the less preserved the dynamic force which it and all other drugs possess.

The doctrine of the conservation of energy, which declares that force is never destroyed whatever its changes in manifestation may be, is as applicable to drugs and their dynamic action, even though the force is shut up in an amalgam filling and *apparently* inert, as it is to a simple piece of charcoal, which needs but a spark to make more manifest the hidden energy stored up in its component parts, and upon the liberation of which may show itself subsequently in manifold forms, such as heat, vapor, gases, and all the compounds both of organic and of inorganic life.

A man who does not thoroughly understand and accept this doctrine as one of the established laws of the universe will not be likely to understand the action or, in other words, the energy of drugs when potentized and the laws which govern it; for the energy which lies hidden in the mercury of an amalgam filling is none the less potent and subject to these same laws than it is either in its crude state or as a component part of some compound other than an amalgam filling.

I have heard men in our profession deny with the greatest positiveness, without attempting to offer any reason for their assertion, that there can ever be any possible injurious effect or influence produced upon the system by amalgam fillings.

Such men I believe in all sincerity are entirely unaware that mercury is one of the most poisonous of drugs and one of the most difficult to eliminate from a system which has once been susceptible to its toxic effects. There is surely no other drug, poison, or disease, not even syphilis itself in its worst form, that becomes a more difficult matter for the physician to eradicate from the system. Being one of the most deep-seated and deep-acting drugs, its physiological effects often come under our observation within the field of our own special work.

The least we can do in getting at the truth of the point at issue between the two professions is, first, to study the action of the drug both as to its physiological and medicinal properties; second,

to study carefully the dual action of drugs in general; third, to study the laws which govern such action; fourth, the proving of potentized drugs upon one's self with a view to becoming satisfied whether or not there is that dynamic action in them and possessing actual curative properties which all who have faithfully studied them know they actually possess; and, fifth, the bearing of these laws upon the question we are considering.

When I assure you that such has been my endeavor the past year that I might be able to speak without prejudice in writing my paper upon this subject, you will readily understand that I come before you not for the purpose of stirring up personal controversies and seeking besides the disruption of societies, as it was argued would do had my paper been granted a hearing before the Massachusetts Dental Society, but rather from an earnest desire to contribute my share of whatever may be of help or interest to any man in our profession.

It may be asked, Why are not the cement fillings equally injurious, considering their composition?

I reply that there is, in both cement and gold fillings, the same kind of dynamic force, but that it is not of such a poisonous character, nor does it act in either case as such a powerful obstruction to the action of indicated remedies as is unquestionably true of mercury.

I may say right here that I have one patient who is so susceptible to aurum that whenever a new gold filling is inserted in any of her teeth an ulcer invariably appears within twenty-four hours upon the mucous membrane immediately about the tooth and upon the tip of the tongue from the constant touching of the tongue against the filling,—the taste of the metal being as plainly evident to the patient as is that of the copper in a copper amalgam filling to patients peculiarly susceptible to cuprum. A glance at the homœopathic materia medica will reveal the ulcerations I have alluded to under the symptoms obtained from provings of aurum.

Among my patients are many sent to me suffering from chronic diseases and complaints of various kinds, with instructions from the physician to remove all amalgam fillings. The scepticism of a large majority of such patients, supplemented by that of their families and friends, that a removal of the fillings would result in any visible improvement in the patient's health has been generally equal to what my own want of faith until recently was, that there was either truth or sense in the statement made by physicians, and I am frank to admit that no person who was familiar with the



patient's condition before the fillings were removed, and by a subsequent following of the case to notice the effect, if any, of such removal, could be more amazed than I have been at the improvement which has invariably followed.

Did time permit I should be glad to speak in detail of many cases where the action of the physician's medicines subsequent to the removal of amalgams was all that he knew it was capable of doing and should do in sending his patient on to a speedy improvement in health.

These cases are all a matter of record, and if any one desires proof that I am making statements that cannot be fully substantiated, I shall be happy to give him the names of such patients, to whom he can personally write for all the information he desires.

Therefore, if my statements appear to any one at all dogmatic, let it be remembered that I have made them fearlessly, and with the hope that all who take exception to them will remember that they have not only the same opportunity to verify them that I have had but that it is their *duty* to do so.

The opposition to amalgam fillings, gentlemen, is one that has come to stay. Let no one deceive himself on this point or try to laugh it away, for it is by no manner of means confined to "a few physicians practising in Boston," as a former president of the Massachusetts Dental Society declared so positively at the twenty-seventh annual meeting of that Society. A little investigation would have shown him that it covers a territory extending from Maine to California, and from Texas to the extreme north of Canada, while a visit to the shores across the Atlantic would have shown to him the same unyielding opposition.

It will not be understood from what I have said that I believe amalgam fillings in every case offer any obstacle to the physician in the treatment of disease, and consequently have any evil effect upon the system, for it is only when a person whose teeth are filled with amalgam is peculiarly susceptible to mercury that medicines will not have their proper curative effect; but the fact that a person may be susceptible to-morrow if not to-day should make us recognize the duty of abandoning absolutely the use of amalgam so far as it is possible to do so.

Speaking upon the subject we are considering, the statement was made by a member of the Massachusetts Dental Society at the twenty-seventh annual meeting that he did not wish to be compelled to ask, when treating a patient's teeth, "Who is your medical adviser?" and to act on the doctor's judgment instead of his own.

Would it not be well when a patient is sent to us with instructions from the physician to remove all amalgam fillings from the teeth of his patient to courteously comply with the request, at the same time taking pains to follow the case after it has left our hands and note whether there is any improvement or not? If there is, it will at least set an honest man to thinking, and prompt him to follow a line of study similar to the one I have suggested. If there is no improvement, then he can at least have the satisfaction of going to the physician with a request for the reasons why his medicines then fail to do what he claimed they would in restoring health to his patients.

Health is one of the dearest things of life, and no one sufficiently prizes its value until he has been deprived of it. Among my patients are those who have not known for years what a return of it meant to them until it began to be gradually restored to them after I had conscientiously and painstakingly removed every particle of amalgam from their teeth, with as earnest a desire to prove that physicians were either wholly right or wholly wrong as to do what lay in my power in helping to bring to the patient what he was most in search of.

Therefore I feel that so long as we as dentists are content to stand aside and obstinately ridicule and contradict statements made by physicians eminent not only for their skill in successfully combating disease, but for their scholarly and scientific attainments as well, before we have patiently investigated the matter for ourselves and obtained some positive knowledge, so long shall we be in a humor to discuss the question before us without profit to ourselves and without the desire even of acquiring any new scientific truth.

One fact or principle evolved by both inductive and deductive processes of reasoning, and plainly demonstrated by actual experiment so there is no way of getting around its acceptance, is worth a thousand idle or thoughtless assertions from you or me which prove nothing, having nothing but an individual opinion back of them on which to rest.

Due regard for your patience in listening to my paper will permit me to allude to but one of the most interesting cases I have ever followed, where some twenty or more amalgams were removed from the teeth of a patient who had been almost an invalid, suffering from a complication of troubles for many years, and whose testimony is but that which has been expressed to me by other patients, often in much stronger terms and supplemented by the severest condemnation of amalgam fillings.



Upon my request recently that he give me a brief statement of his case he writes as follows: "Until four years ago I had been all my life under allopathic treatment, taking large quantities of medicine and being, I have no doubt, much of the time drug sick. For nearly four years I have been under homœopathic treatment, and while for the first two years I experienced great relief, much greater than ever before in my life, still the improvement was not so great or so lasting as my physician wished, and at his request I came, as you know, to you to have all my amalgams removed. Although the suffering was great I can truly say I am glad it was done, as my health has improved much faster since then, and I have every reason to believe it is because I am free from the injurious dynamic influence of the mercury contained in the amalgams. I have now better health than I have had for years, and it is rapidly improving."

Relative to the circumstances which have culminated in the reading of my paper before a society other than the one for which it was originally prepared, I may be permitted to say a few words in closing not entirely irrelevant to the subject before us.

In his response to the toast "The World's Columbian Dental Congress," at a recent meeting of the Central Dental Association of Northern New Jersey, the president of that Congress is reported, in the July issue of the INTERNATIONAL DENTAL JOURNAL, to have given utterance to the following words: "*Every man who has a thought of value, a fact which is of interest to his fellow-practitioners, will have an opportunity to present that thought or that fact to that Congress.*"

In view of the determined opposition which the distinguished gentleman himself has in the past maintained towards any one desiring to come before the Massachusetts Dental Society with a paper bearing the title of the one under consideration, and the opportunity given by that Congress to every man to act in accordance with the most liberal interpretation of that sentiment, may it not be within reason to hope that, forgetting the childish, not to say discourteous, action which the Massachusetts Society took a year ago towards one of Boston's most scholarly physicians, and, more recently, the same action towards one of its own corresponding members in good standing, the day will yet come when an opportunity will *always* be cheerfully given to you or to any man who has a thought of value, a fact which is of interest to his fellow-practitioners, to present that thought or that fact to that society and under whatever title he may see fit to select?

Assuming that not the least of the objects and lessons of the recent Congress was the giving to every man the fullest encouragement to that kind of scientific investigation which leads to the discovery of truth, the granting to every man the privilege to bring before any society the results of such investigations, and at the same time the cultivation of professional courtesy among members of the same calling, you will, I am sure, join with me in the hope that that day is rapidly disappearing when such a spirit of medical intolerance as that so recently exhibited by your State Society will ever again be tolerated by any society that claims to be scientific.

And now let me say in conclusion, that if my paper stirs any thoughtful mind to make a careful and conscientious investigation of this matter before indulging in sweeping assertions and slurs upon our friends of the medical profession for the sturdy maintenance of convictions which are born of experience and founded upon well-established laws, the time you have given to its hearing will have been neither unwisely nor unprofitably spent.

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## THE PSYCHOLOGICAL ASPECT OF HYPNOSIS.

BY WM. ROMAINE NEWBOLD, PH.D.<sup>1</sup>

MR. PRESIDENT, LADIES, AND GENTLEMEN,—In responding to your invitation to present to you the psychological aspect of hypnosis I find myself confronted by sundry difficulties. The phenomena in question are exceedingly complex, and it would be impossible to give an adequate review of them in the scanty time at my disposal. In the second place, they have engaged the attention of the scientific world but a few years, and many reported phenomena cannot be regarded as incontestably established. And in the last place, there is no consensus among psychologists as to the construction that is to be placed upon them.

The theories, psychological and physiological, that have been proposed to account for hypnosis are very nearly as numerous as the theorists, and not one has met with universal acceptance. Yet we are by no means relieved of the responsibility of framing hypotheses. Scarcely ever has a great scientific generalization been

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established that was not constructed out of the ruins of a thousand hypotheses, and unless those thousand hypotheses had been devised, tested, and successively found wanting, we would never have had the material out of which to construct the true explanation. It is in this light that I regard the theory which I shall have the honor of putting before you to-night. It is based upon the facts of hypnosis chiefly as observed and reported by the school of Nancy, which my own limited experience has in every respect confirmed, and is most nearly akin to that of Dr. Despine. It is an effort to bring the facts of hypnosis into line with the psychological doctrine of the dynamic mental state, a doctrine which was, I believe, first taught clearly by Herbart, but for which a satisfactory scientific foundation has been but recently supplied by the researches of neurologists into the functions of the cerebral cortex. Scanty and disputable as our knowledge on these points is, there is a substantial agreement between the main results of introspective observation on the one hand and clinical observation and direct experiment on the other which is exceedingly encouraging.

You will readily understand that within the limits of this paper I can do no more than state and make plain the leading features of the tentative theory upon which I am now working. It is a theory that brings the chief phenomena of hypnosis into harmony with fundamental psychological principles and with the fundamental principles of cerebral physiology as far as I understand them, but which must undoubtedly suffer extensive modification as our knowledge of mind and brain progresses. I shall, however, in concluding, point out some of the dangers attending the practice of hypnotism and say a word as to the relation often supposed between hypnotism and telepathy.

It has long been known that certain individuals can be put by the use of definite agencies into a condition closely resembling sleep, but differentiated from it by sundry traits. These agencies are numerous, but all agree in involving the checking of the train of ideas, the restriction of attention to one idea or sensation, or to a constantly recurring but narrowly limited series of sensations, such as is given by passing the hands before the patient's eyes, by light touches or stroking, by rotating the head upon the shoulders, and so on. After the lapse of a time that varies in different individuals from a few seconds to thirty minutes or more, phenomena closely resembling sleep supervene. The eyelids become very heavy; they close; the field of consciousness becomes narrower and narrower, wanes, and finally disappears. When the patient awakes he believes that he

has been asleep. But we can show that he has not been asleep in the ordinary sense of that word. He is nearly always cataleptic; his limbs tend to retain any position impressed upon them by the operator. He appears to be keenly alive to all that the operator says and does, but has neither eyes nor ears for any one else. This is the so-called phenomenon of *rappor*t. He is frequently partial and sometimes totally analgesic. Pin-pricks and pinches are felt as touches, and burns as warmth. Sometimes, although not as often, he presents hyperæsthesia of sundry senses. He can read fine type at a considerable distance, can hear sounds that he cannot hear in the normal state, or can distinguish the compass points when very near together. But the most marked and most constant symptom is his absolute obedience to the word and wish of the operator. If told that he cannot open his eyes, cannot bend his arm, he cannot. If told to open his eyes, he opens them; if told that an elephant, a ghost, or anything else you please is before him, he sees it; and similar hallucinations can be produced in all the other senses. Negative hallucinations can also be produced. The operator can by a word destroy sight, hearing, touch, and other sensations, or can make the patient blind to one object or person, deaf to one sound or the voice of one person. Nor is it necessary that the suggestion be executed while the patient is in this abnormal condition. It may be executed hours, weeks, or even months afterwards. Sometimes the patient passes spontaneously while executing it into the condition in which he was when it was given, and he is then usually not aware that he has done it. Sometimes he does not so relapse, but executes it in his normal state, and then he will often devise all manner of plausible pretexts for his action,—anything, indeed, will he allege except the true reason, and that he rarely suspects. Finally, and this is the most characteristic symptom, no matter how deeply he appears to be asleep, he can nearly always be awakened by a word. If I leave the patient undisturbed for a time while thus apparently asleep, all these phenomena usually disappear. He is no longer cataleptic, analgesic, hyperæsthetic, or suggestible; he is no longer *en rapport* with the operator, can no longer be awakened by the simple command; in other words, he is truly asleep in the ordinary sense of that word. Sometimes, however, if left to himself, he will awaken spontaneously, and no evil effects follow. He may feel a slight drowsiness, lassitude, or chilliness, such as we often feel when awakened from a nap, but nothing of a more serious nature need be feared.

I have described to you the hypnotic state in its most marked form,—that which is known as deep sleep, or lethargy. About twenty per cent. of all normal and healthy adults, if we accept the conservative estimate of Dr. Moll, can be put into this condition. Of the other eighty-odd per cent., about twenty or twenty-five per cent. are not at all or but little affected by the agencies which I have described. A slight drowsiness and weight in the eyelids they will probably feel, but not more. The remaining fifty-five or sixty per cent. are affected in various ways and to various degrees. Hardly will any two individuals present exactly the same phenomena, and scarcely any two writers agree upon the degrees that are to be recognized. Dessoir recognizes two, Charcot three, Forel three,—but his three do not coincide with those of Charcot,—Liébeault six, Chambard six, Bernheim nine, etc. Of these, the two proposed by Dessoir seem to me worthy of note. In the first grade only the power of originating voluntary movements is affected. Consciousness remains undisturbed, but the voluntary muscles are more or less withdrawn from voluntary control. The smaller and more highly specialized groups, such as those controlling eyes, lips, tongue, and fingers, are the first to be affected, then the larger groups. Suggestions affecting these muscles will then be executed, but hallucinations cannot be produced, nor will post-hypnotic suggestions be executed. In the second grade both the sensory and motor systems are affected and are subject to the suggestions of the operator. This is usually found in lethargy, but frequently without it. In the first grade only the functions connected with the efferent nerves are affected, in the second those connected with the afferent as well.

It is agreed by all observers that the most characteristic trait of hypnosis is the heightening of suggestibility. To this, catalepsy, automaton-like obedience, and the production of hallucinations can be reduced. Spontaneous analgesia and hyperæsthesia cannot be reduced to suggestibility unless the operator has carelessly dropped some remark in the presence of the patient indicating what he expects to find; yet in explaining suggestibility we shall, I think, find the clue to the explanation of these phenomena also.

Suggestibility is found in all normal individuals. Volumes have been written in illustration of the fact that the mere lodging of an idea in a man's mind is of itself a certain momentum tending to affect his action. It may take root and grow, or it may seem to have fallen upon barren soil and produce no effect. The world-wide phenomena of unconscious imitation, the influence which we

unconsciously receive from our surroundings and exert upon another, the curious epidemic manias of the Middle Ages, periodic epidemics of crime, of which we have recently had several, all these are illustrations of the fact that the suggested idea is a momentum that has its own weight, which may indeed be overpowered, but which must always be taken into consideration. Now, in all degrees of hypnosis and in many conditions not classed as hypnotic the force of the individual idea is greatly exaggerated. In the most extreme cases it is no longer one of many momentary influences; it is the controlling power which seems to fatally determine what the man shall do, and even what he shall see and hear. Of such a man we say that his suggestibility has been heightened.

The explanation, therefore, of hypnosis, from the point of view of the psychologist, turns chiefly upon the explanation of suggestibility, and upon that we must for the present concentrate our attention. If suggestibility is characteristic of the normal man, its explanation must be found in the fundamental laws of mind and brain. We must then determine what conditions limit suggestibility in the normal state, and in what way we may remove these conditions and heighten it.

I must now ask your indulgence for a few minutes as I leave the problem of hypnosis proper and endeavor to sketch the main outlines of a psychological theory or method which we find today very wide-spread among neurologists, and rapidly gaining ground among those psychologists who bring to their proper work some acquaintance with physiology and pathology. According to this view all mental states are accompanied and conditioned by physiological processes in the cerebral cortex. Upon this there is substantial agreement, and it may be regarded as the fundamental postulate of physiological psychology. Its converse, that every cortical process is accompanied by a mental state, is still disputed. If we admit this fundamental postulate, we are compelled to admit its corollary also,—that all the laws that govern mental states must admit expression in physiological terms. And this corollary is fully borne out by the facts, as far as we are able to observe them. We must then, learn to look upon the mental state precisely as we look upon all physical things. Scientific research in the physical world resolves itself into an inquiry into the causes and effects of phenomena, and the case is not otherwise in the mental world. The mental state must have its causes and its effects as certainly as the processes with which it is connected must have their causes and their effects. Its causes and effects need not form clearly distinguishable



rtions of the warp and woof of our conscious life. They may in the dim region that we call subconscious; but they exist, and, our knowledge were exact, we could reason to them deductively with infallible certainty. Now, when we examine our mental states narrowly, we find that even in all the complexity of consciousness we can frequently trace out their causes and effects. Let us examine a few of these cases.

Every mental state is susceptible of development. Its dimmest and least developed form is that of the nascent idea just emerging into consciousness. Its most developed form is found in the vivid sensation which is qualitatively like that idea. This intensity is primarily determined by the intensity of the central or centripetal stimulus by which the corresponding cortical process is awakened; but it also depends upon the cerebral constitution of the individual and upon sundry other conditions.

Mental states have effects. Their ideational effects have long been known to psychologists, and studied under the name of association of ideas. I need do no more than allude to this most common phenomenon of subjective life. They have also motor effects. The relation of the vaso-motor system to the mental state is no new discovery. The blush of embarrassment, the pallor of fear, fainting at the sight of blood, are trite illustrations. Recent investigations have shown, however, that the connection between mental states and the distribution of the blood-supply is of the most thoroughgoing nature imaginable. Mental states also affect the voluntary muscles directly. To Alexander Bain belongs the honor, I believe, of having first established the relation of the motor idea to the production of the movement which it represents. The effect exerted by mental states upon the secretions of the skin, upon the salivary, mammary, and other glands, is a matter of daily observation; but their effect upon the processes of nutrition and repair is by no means as common or as universally admitted. Yet it seems to me that we have sufficient experimental as well as clinical evidence to warrant our admitting the existence of such effects, although we do not as yet understand the nervous mechanism by which they are produced or the conditions under which they operate.

Not only have mental states positive, they have also negative effects. These negative effects are generally grouped under the term "inhibition." They are exceedingly obscure. The development of any mental state seems to affect unfavorably the development of simultaneously nascent but independent states,—a phenomenon commonly treated by psychologists under the title "passive

attention." Individual sensory states sometimes seem to arrest or another directly, perhaps by a species of interference. Motor states can certainly check one another. Into these and kindred questions I shall not at present enter. I have, I hope, said enough to illustrate the fundamental law of which I speak,—that mental states representing to us cortical processes of whose precise character we are wholly ignorant, must be regarded as belonging to the order of system of nature quite as much as those cortical processes with which they are connected, and that we are entirely justified in ascribing to them those dynamic characteristics, those causes and effects which we ascribe to all physical phenomena. And in those characteristics, causes, and effects it is the business of the psychologist to inquire.

It is evident that in an inquiry into the causes of any such state or process we must go over very much the same ground as we have gone over in dealing with its effects. It may be caused *ab initio* by the operation of such antecedent states and processes as I have just described, or it may be caused *ab extra* by some sense perception. In general we term all states originated from without "suggestions," and all originated from within "auto-suggestions." Of the agencies by which I can originate an idea in the mind of another none is as certain and as definite as language. Hence we commonly think of the suggested idea as having been suggested by words; but this is only accidental, not essential.

We have now completed our rapid survey of the dynamic mental state regarded as representing to us a cortical process. But it is evident that I have been presenting to you rather rare phenomena as illustrations of what I conceive to be one of the most fundamental laws of consciousness, and you may justly ask why this law, if it be ever operative, has so long escaped attention. The answer is not far to seek. If only our mental states existed singly, and each were free to develop itself and work out its own results without prejudice to or from other states, there would be little difficulty in determining what those results are. But in all normal states of consciousness the nascent mental state or cortical process finds itself in the midst of countless other subnascent, nascent, or definitely developed states, which it must modify, and by which it must suffer modification in countless and infinitely complex ways. It is therefore, very difficult in the normal state to isolate any state sufficiently to distinguish its results from those of others.

Moreover, there exists in consciousness an activity of which the would-be scientific psychologist, anxious to bring all mental phe-



phenomena under mechanical or dynamic laws, usually says as little as he may. And certainly at our present stage of knowledge it is impossible to analyze it into any component factors or to determine the laws of its operation. Yet we cannot well ignore it, since it is the most constant and most powerful single factor of conscious life. This is what we call the consciousness of self. Sometimes it appears to be latent, and the man reacts upon the stimuli presented to him with almost fatal certainty. But then, again, it appears, and forthwith introduces into the train of ideas and movements an element of capriciousness that was not there before. When it thus presents and exerts its influence over our actions we are said to act voluntarily. The character of this conscious self is largely determined by hereditary influences. But it is also genetically related to the permanent factor in past experience, and may even be described as a function of that permanent factor, since any extensive changes in the latter are sooner or later followed by changes in the consciousness of self. We are, I think, justified in believing that in this at present mysterious inner activity we see the present conscious representative of the net aggregate result of our own past experience, and to some extent that of our ancestors, contented with and acting upon the nascent mental state.

We are now in position to form a more clear conception of what is meant by suggestibility and to point out the chief factors that normally limit it. When we say that suggestibility is characteristic of all men, we mean that any mental state tends to develop to a certain degree and to produce certain definite results. This tendency is not, as a rule, very noticeable for two reasons: in the first place, any given mental state is but one of many, and we can rarely separate its results from those of others; and in the second, it is always exposed to modification by the most powerful and least understood element of consciousness,—the self. I have also tried in passing to indicate those physiological conceptions to which this psychological theory is most nearly related, and, if there be any truth in them, it is evident that the condition which we find in the normal man implies an inconceivably complex inter-correlation and functional co-ordination between the several portions of the cortex and between the organized systems of processes which we must conceive as existing within it.

Under what conditions, then, does suggestibility become heightened? Heightened suggestibility is found occasionally as a spontaneous phenomenon. Pierre Janet has, for example, a patient who is as suggestible in the waking state as most persons are in hypnosis.

She has never been hypnotized. It is sometimes found as one of the effects of certain drugs, among which are alcohol, ether, morphine and chloroform. More light is much needed upon this question. Many dreams are due to the suggestions given by strong stimuli which penetrate to the brain and arouse smouldering cortical processes, which pursue their devious way unhampered by the restraints of waking life, hence the frequently grotesque and unreal character of dreams. It is sometimes possible to cause a person to pass from normal sleep into a condition of heightened suggestibility that cannot be distinguished from hypnosis. An analogous state frequently occurs spontaneously, and is known as somnambulism. But of all the means of heightening suggestibility with which we are acquainted, none is as easy of application and certain in its effect as the concentration of attention and limitation of the conscious field; and those effects are, as far as the subject can describe them, precisely what our study of normal conditions has led us to postulate as the chief requisite to the production of heightened suggestibility. Sometimes the entire field of consciousness appears to fade away. Then we may suppose that the only things in consciousness are the isolated ideas which the operator suggests. In others the definite heterogeneity of normal life gives place to a dreamy state in which the vivid active self seems to have retired from the field. In others the self-consciousness remains, but finds itself so weakened that the commands of the operator appeal to it with irresistible power. This enfeeblement or destruction of the self is the most characteristic phenomenon of hypnosis, and is the chief reason for the heightened suggestibility. The nascent mental state finds its chief obstacle to its independent development removed, and we can study that development and its effects under new conditions.

We must not, however, assume that the development and effects of the mental state in hypnosis are what they are in normal life, or what they would be in normal life were we able to remove other influences without in any way modifying the intrinsic character of the state which we wish to study. The checking or stilling of self-consciousness is the most characteristic change of hypnosis, but it is by no means the only change; and the other changes which are found in different subjects are so numerous that it is impossible to describe them. One of the most common symptoms is what may be described as a species of mental inertia. An idea which in the normal state would awaken a mass of associated ideas, and thus give birth to a long train of ideas, will fall dead and inert in the hypnotized mind; it seems to have spent its energy in getting to

existence. But occasionally the exact contrary is observed. A mere hint from the operator lodging in the sensitive brain of the subject will be spontaneously developed into a tragedy or comedy, as the case may be, and be acted out with a vivacity and power of which the normal individual would be incapable. In these and other personal peculiarities, such as the spontaneous analgesia and hyperæsthesia which I have mentioned, we may recognize variations in the distribution of cerebral activity of whose exact character we cannot form even a conception, and which doubtless rest upon organic and dynamic peculiarities in the cerebral constitution of the individual.

What cortical modification are we to conceive of as taking place in hypnosis? This is a question that is more easily asked than answered. I think we may say with some confidence that the normal cortical co-ordination of waking life is profoundly modified. This is indicated by the inhibition of the activity of the conscious self and the spontaneous alterations in sensation. But if we ask further just what portions of the cortex are chiefly concerned in this modification, it seems to me impossible even to propose a theory. We do not know whether the voluntary activity of the self is definitely related to some cortical area, as the various special senses are, or whether it is related to some cortical layer as supposed by some, or whether it is related to some organized system of processes distributed through the entire cortex. And as this is the psychical activity which is most profoundly modified in hypnosis, we may suppose that those portions of the cortex which are concerned with its manifestation are those chiefly modified in hypnosis. Yet, as I have shown, we have reason to suppose that other changes take place whose exact character we do not know at all. If, however, we ask to what other changes this modification of the processes connected with the manifestation of self-consciousness are most nearly related, I think we may say with some confidence that they are most nearly related to the changes that normally take place in sleep. In normal sleep the continuous ebb and flow of molecular change that accompanies waking life slowly and irregularly comes to a stop. Some little may remain in various portions of the brain, but it is for the most part in a state of comparative quiescence. In hypnosis we have reason to think that a similar stilling of the molecular activities begins to spread throughout the brain. In some way which we cannot now explain, the fixation of attention and voluntary limitation of the conscious field inhibits the activities connected with the conscious self first. If we leave the patient to himself

these activities will either reassert themselves, or else the same change will spread on throughout the brain until the patient is in a normal sleep. And in the case of some persons this is the only effect that we can produce, by the use of the agencies which induce hypnosis in others. But if we do not leave the patient alone, but give him suggestions, we find that a large portion of the brain remains sensitive, that induced mental states or cortical processes—for some authorities contend that cortical processes in the hypnotized patient are not accompanied by any kind of consciousness—work out results which cannot be obtained in the patient while in the normal state. Hence hypnosis is in a sense a normal state artificially prolonged. It would, perhaps, be too much to say, with Mr. William James of Harvard, that we all pass through the hypnotic state every night while going to sleep. It seems to me probable that the methods which we use to produce hypnosis have a specific effect in determining the order in which the cortical activities are sunk into sleep, so to speak, which is not found in normal sleep. Yet the changes which take place in hypnosis probably do not essentially differ from those of normal sleep.

The phenomena of the hysterical condition, of epilepsy, of some dry forms of insanity, and of the rare trouble known as double consciousness, present many points of similarity with hypnosis, and we shall probably not be far wrong in classing all together as being due to derangement of cortical co-ordination. Sometimes, as, for example, in some forms of epilepsy, we have reason to believe that this disturbance is itself due to gross local lesions of the cortex. In many of these mental troubles we find derangements in self-consciousness and loss of voluntary control over different sensory and motor areas, and this is not seldom connected with heightened suggestibility. These facts have led many good authorities, notably Professor Charcot and the school of Paris, to regard hypnosis as a neurosis of the hysterical order depending upon some cerebral abnormality. I can therefore scarcely conclude this paper without making mention of this view and briefly indicating the reasons which lead me to dissent from it, although I do so with the modesty of the layman.

The researches of the school of Nancy have conclusively shown that the hypnotic state can be induced in the immense majority of normal adults, and they have been unable to discover any relation between susceptibility to hypnosis and hysteria, neurasthenia, or any other recognized disease. If, then, hypnosis is a disease, we are nearly all more or less tainted with it. This conclusion is supported

y Moll, Dessoir, Wetterstrand, Forel, and many others. In the second place, I think that it is a misuse of language to term a state which can be experimentally induced and ended, but which does not spontaneously occur, and which, when thus experimentally produced and ended, does not tend to unfit the patient for the duties of life, a disease. But if ever we find hypnosis occurring spontaneously, it would tend to interfere with the patient's discharging his duties as a member of society, and in that case we would be justified in regarding it as a true neurosis of the hysterical order.

I have said that hypnosis may be regarded as an artificial prolongation of an approximately normal state. But, you may ask, what is the effect upon the patient of this artificial prolongation of normal state? If the hypnotic state involves, as I am inclined to suppose, a temporary dissociation of cortical processes normally coordinated, even though this dissociation be produced by normal agencies, may it not be that by fixing and prolonging it beyond the normal time we may in a way loosen the bonds of union between the different areas of the cortex and produce a true hysterical neurosis? The question is most pertinent, and can be answered only by reference to observed facts. Some few cases of mental disturbance have been reported from the use of hypnosis, but such cases have been so few in number that we are justified in saying that the danger of such results in the case of the healthy patient in the hands of a trained operator is practically negligible. Some slight physical discomfort, as headache, drowsiness, and lassitude, are frequently found, but can usually be removed by suggestion. Headache is a very common symptom. But the only danger which is both serious and common appears to be the production of increased susceptibility to the hypnotic state. This is a very real danger, and we must ever be on the watch against it and cease experimenting at the first suggestion of it. Most authorities believe that we can always ward against it by suggestion. We can to some degree, but I know of no facts that show that the suggestion will last as long as the increased susceptibility to hypnosis.

Apart from the physical dangers springing from the use of hypnosis, we must consider the moral. That moral dangers exist there can be no question. Already several cases have been reported in which criminal assault has been committed by the aid of hypnosis, and the French experimenters have enticed patients to commit imaginary murders and thefts, to sign promissory notes, and to bear false witness in the same way. Yet I do not feel that our present knowledge justifies much apprehension on this score.



We hear much in the literature of hypnotism of the cases in which the suggestions succeed, but little of those in which they fail. And they very often fail, as I shall hope to show you to-night. A suggestion whose execution the patient would find repugnant in the waking state will often meet with great resistance and sometimes fail of execution. The influence of the operator over his patient is much greater than in waking life, but it is perhaps never absolutely complete, and if there are persons who could be induced by hypnotic suggestion to commit crimes from which they would shrink while awake, such persons are probably exceedingly rare and their weakness is rarely suspected. One other danger remains which must not fail to mention, and that is the danger springing from careless suggestions. I know a gentleman who thoughtlessly told his patient that the devil was after him, and had great ado to save the terrified patient from throwing himself from a sixth story window. The operator must ever remember that his every word is caught by the patient, no matter how impassive the latter may seem, and he must always be on his guard against saying anything of an exciting or terrifying character.

I have never seen any good reason for believing that there is any relation between hypnosis and telepathy. It is true that telepathic phenomena are from time to time reported as having been observed in hypnosis, but such phenomena are also reported in the waking life. Most certainly the hypnotized patient is not, as a rule, sensitive to telepathic influences. But even if we admit that he sometimes is, it would not essentially modify the theory which I have outlined, and we would not be compelled to return to the theory of a force emanating from the operator and controlling the subject. We would merely be compelled to admit the possibility of a suggestion being conveyed in some way and by some means not at present understood.

In conclusion, let me say a word or two on the practical principles that should guide us in the use of hypnosis. No one should attempt it without having thoroughly studied the question, acquainted himself with the works of the great authorities, and having had some experience with an instructor. Its use should be limited to purposes of research, instruction, and therapeutics. A witness should always be present. The operator must rigidly respect the personal rights of the patient. He must have his full and intelligent consent to the experiments proposed, and must never endeavor to obtain influence over him at times or in ways other than those agreed upon. He must guard the patient effectually from any future

inconvenience arising from increased susceptibility, and if he have reason to doubt his ability so to guard him, he must stop his experiments. And in the last place, and this principle includes all the others, he must ever have in mind and at heart the true welfare of his patient, and act in accordance with it.

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## Reports of Society Meetings.

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### NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, November 21, 1893, at the New York Academy of Medicine, No. 17 West Forty-third Street, Dr. Woodward presiding.

The minutes of the previous meeting were read and approved.

Under the head of "Incidents of Office Practice and Casual Communications," Dr. Van Woert exhibited a mouth-lamp which was much less expensive than the ordinary electric mouth-lamp used and just as effective.

*The President.*—At our last meeting Dr. Van Woert, of Brooklyn, presented a paper on "Pyorrhœa Alveolaris," and the Executive Committee thought it well to continue the subject for this evening. Professor C. N. Peirce, of Philadelphia, has come prepared with a paper, which he will now read to us.

(For Dr. Peirce's paper, see January number, page 1.)

Dr. Peirce followed the reading of the paper by the subjoined remarks:

Frequently patients come designating a certain tooth, which, they state, was perfectly sound and firm until such a person wedged or hammered it. "Now see its condition!" The theory taken by pathologists is that the urates are not in any tissue until that tissue has had its nutrition disturbed. I had a circumstance occur about two weeks ago in my own practice which I think has given me some light. A gentleman who lost all his teeth from pyorrhœa, and who for some years suffered with what he thought was paralysis of the pharynx, finally had an operation for calcic deposit in the bladder, when two large stones were removed. His son is a

patient under my care at this time. Two weeks ago I discovered a small cavity on the distal surface of an inferior molar. I packed between the molars some cotton to separate them, and renewed once or twice, and then filled the cavity. He has been in three or more times complaining of pain in the filled tooth, which has since developed pyorrhœa. For three nights it had awakened him. That the tooth was free from pyorrhœa until very recently I have no doubt. My theory is that I must have produced a certain amount of irritation and disturbance of nutrition in the tissue at the end of the root, and by doing so made it susceptible to a ready receptacle of the uric salt and the subsequent consequences. This is the only explanation I can give which is consistent with the theory now held by pathologists.

I have brought with me some pyorrhœa specimens, also some which I have termed pytalogenic, the former being hæmatogenic. When uric acid deposits are broken up by heat we have ammonia set free, and it exhibits itself by coloring the litmus-paper blue. There is, however, the danger of having organic matter decompose at the same time, which will also set free ammonia and give a similar result.

#### DISCUSSION.

*Dr. Jarvie.*—Will you please give us the two terms again?

*Dr. Peirce.*—The terms I had prepared were pytalogenic calcic pericementitis and hæmatogenic calcic pericementitis.

I have here some of the deposit taken from this root. I will put it in this tube and place the litmus-paper, moistened by distilled water, in the neck of the bottle. Now, by subjecting it to heat you see that the paper is changed to a decided blue color.

*Dr. Van Woert.*—Before Professor Peirce finishes, I wish he would give us a little idea of his treatment of this disease.

*Dr. Peirce.*—I was a little premature in my paper. I should have had another month before I read it to you, but as the meeting was at this date, I gave it in an unfinished condition. I have only two patients now on constitutional treatment, and therefore I cannot give any statements regarding its success; but I have a number of patients who come to me regularly, and I shall take the most favorable opportunity to place them under the treatment suggested in the paper, to see whether I can accomplish anything.

*Dr. Van Woert.*—I mean as to the surgical or mechanical treatment.

*Dr. Peirce.*—I simply use the scalers in my best efforts to cleanse



the roots, considering the deposit an irritant; then I treat with a good antiseptic, and the most satisfactory to me is aristol dissolved in chloroform, with the addition of oil of gaultheria and oil of cinnamon or cassia, equal parts of each.

*Dr. Allen.*—But that does not dissolve the deposit.

*Dr. Peirce.*—No; it is merely an antiseptic. To cleanse the root, I make an application of trichloroacetic acid with great care, for it is a powerful caustic.

*Dr. Hodson.*—Do you use that in the pockets?

*Dr. Peirce.*—Yes; whenever the patient comes to the office for treatment, I wash out the pocket with peroxide of hydrogen, and then make this application followed by the antiseptic. I have found no local treatment more satisfactory. If the gums are much congested on the surface, I paint with tincture of iodine in addition.

*Dr. Jarvie.*—Is there a breaking down of the tissue?

*Dr. Peirce.*—Yes, of course; the inflammatory condition with exudation degenerating into pus facilitates this.

*Dr. Perry.*—In your paper you gave some prominence to the presence of micro-organisms as being one of the factors in producing this condition.

*Dr. Peirce.*—I said the bacteria present had been considered by Dr. Black as pathogenic, but the pathologists do not consider them so. The staphylococcus is not considered a pathogenic bacteria, although Dr. Black thinks it is. He says he can take the pus of pyorrhœa and inoculate sound or healthy tissue and produce a similar condition. He will inoculate, of course, on the gingival borders, and he may produce an irritation, but I do not think he can produce true hæmatogenic calcic pericementitis. Whatever irritation he establishes in this way is amenable to local treatment.

*Dr. Perry.*—You use your remedies in an antiseptic manner, and that is an assumption that bacteria are one of the factors.

*Dr. Peirce.*—Yes, they are a factor in degeneration. I use it to prevent their further influence in the breaking down of the soft tissue.

*Dr. Hodson.*—Does Dr. Peirce expect with these patients to merely fill the pockets anew every month, or is it necessary to go through and examine the whole socket to find out if there are any calcic deposits?

*Dr. Peirce.*—I make the examination of the teeth every month. As far as I can, I remove the deposits without lacerating the soft tissue, and then wash out with peroxide of hydrogen and apply the preparation of which I have spoken.

*Dr. Allen.*—Did you say you had found these deposits while the gingival border of the tooth was intact and perfect?

*Dr. Peirce.*—I have had cases which I have so interpreted. These cases have subsequently developed into pyorrhœa, and I have been confirmed in that by carefully watching them. A deposit will take place at the end of the root with exudation as a concomitant while the gingival borders are intact, the exudation degenerating into pus, and this following the line of least resistance finds exit at the gum margins.

*Dr. Allen.*—In one part of his paper the essayist places us in a position between "the devil and the deep sea." In other words, he said the process of separating the teeth, by producing an irritation or an abnormal condition of the peridontium, would produce a deposit of the calcium urate; that the wedging of the teeth would leave the membrane in a condition that was susceptible to this deposit of lime salts. I would like to know exactly how far he would carry that, in advising us to alter or amend our practice in regard to separating teeth for filling.

*Dr. Peirce.*—I said pathologists had stated that the deposit of a urate was not made in a tissue unless the nutritive conditions of that tissue were somewhat disturbed. A patient of whom I have spoken was of a uric-acid diathesis, inherited from his father. This patient, being of such a diathesis, I believe that I induced this condition by wedging the tooth. I have had in my practice patients come to me and say, "Look at my front tooth. It was perfectly healthy until such a person wedged it." A lady recently brought a tooth to me in her hand, and said, "That tooth was sound until a dentist wedged it, and then there was pus around it, and it came out." I examined her mouth and found she had pyorrhœa. Dr. J. A. Woodward, of Philadelphia, asked me a short time since if we did not induce pyorrhœa by ligatures around the teeth. I did not quite appreciate his question then, but now I can see it if it is true that the deposit is not made in healthy tissue, but in tissue where the nutrition is disturbed. In a patient with a uric-acid diathesis we may induce pyorrhœa by a ligature or by causing an irritation in any other manner.

*Dr. Perry.*—What is to be said and thought, if this theory be true, of a certain number of cases that we meet, where teeth loosen and come out without any signs of calcic deposit?

*Dr. Peirce.*—It is simply the fact that the urates may be carried out by the pus and not deposited. The tooth the lady brought me last week was perfectly free of deposit, and yet pus had flowed

freely from it for over a year. The flow of pus and the inflammation of the pericemental membrane which induces the absorption of the process would, I take it, be indications of the pyorrhœal condition.

*Dr. Howe.*—I can hardly express my gratification and pleasure at listening to this paper from Dr. Peirce. At the last meeting I opposed the view that micro-organisms were an important factor in the causation of this disease, and said, also, I could not accept the opinion that calcic deposit was essential to the origin of the lesion, because the disease may begin and progress without any deposit being discoverable beneath the gum margins. It gives me great satisfaction to listen to this record of Dr. Peirce's original investigations and the proofs he has to offer that this trouble is—what I have long believed—of constitutional origin. I would object, however, to his terminology for the reason stated, that solid concretions are not necessarily connected with the form of the disease which he has well called hæmatogenic. The word calcic I think is misleading, and ought not to be used in such connection. I think it probable that he believes as I do, that the deposit is a factor in aggravating the disease and in preventing restoration of the tissues to health, and that therefore, as far as possible, it ought to be removed; but that it is not an etiological factor. I said the other night that I had seen many cases of pyorrhœa in which there was no calcic deposit concerned in the destructive progress, and one or more gentlemen said, to my surprise, that they had never seen such a case. Yesterday and to-day, while treating two cases which have been in my hands for some time, I took impressions of teeth about which characteristic shrinkage of the gum has taken place: a shrivelling of the gum at and above the margin, but no recession has occurred. The gums are anæmic and thin, and the loss of part of the alveolar borders has caused the gums to sink down, so that a crease or wrinkle can be seen along the line of the loss of hard tissue under them. There is slight loosening of the teeth, perceptible to the fingers, but there are no concretions under the gums. I will pass these models around. I believe that these cases, although not so common, are just as characteristic of the disease as if there was ever so much calcic deposit. There is no doubt in my mind that all these troubles come from constitutional causes. I have been talking to my patients on that line for a good while.

In February of 1891, on my relating to Dr. T. F. Allen, a well-known physician of this city, the characteristics of this disease, as well as of erosion of the teeth, he stated it to be his belief that all

such destructive processes were due to lithæmia. He said that treatment, diet, and so forth were prescribed which were adapted to a condition of excess of uric acid in the system, these local lesions would be favorably affected and possibly cured. Shortly after the questioning a patient who had considerable erosion, mostly affecting the roots of the teeth, which were exposed to a great degree by the wasting of both alveoli and gums, some teeth being loose, she said she was gouty by inheritance from both parents, and that Dr. Allen—before referred to—had told her more than ten years before that the condition of her teeth and gums was due to her gouty tendency. Since that time I have been observing and questioning a number of patients who have either erosion or pyorrhœa alveolaris, or waste of alveolar and gingival tissues without distinct pyorrhœa, and have been quite convinced that all of these lesions of dental tissue are associated with the lithæmic condition. I therefore congratulate Dr. Peirce on being the first to publicly make known what I believe to be the truth in regard to the etiology of pyorrhœa. Of course there is much to be done in elucidating the theory. I have made some observations which I hope to be able to present at some future time.

*Dr. Jarvie.*—What proof have you that there is no calcic deposit on those roots?

*Dr. Howe.*—The usual proof. Failure to find it.

*Dr. Jarvie.*—There is nothing on the model to indicate that there is not.

*Dr. Howe.*—All those teeth are marked with a characteristic shrinkage of the gum.

*Dr. Jarvie.*—I should say from the model that you would find the calcic deposits between the second molar and wisdom-tooth.

*Dr. Howe.*—What would you say about the other molars?

*Dr. Jarvie.*—I do not see any great recession of the gum.

*Dr. Howe.*—That is just the point. There is no recession of the gum. There is a peculiar depression and thinning of the gum tissue, caused by the destruction of the alveolar margins, under the soft tissue. All these molars are affected in the same way. The destructive process has begun, and advanced sufficiently to cause some of them to be slightly loosened, but there is neither recession of the gum nor concretions under the gum. The real condition is only revealed by careful observation.

*Dr. Walker.*—In regard to the patient in whose mouth Dr. Peirce placed the wedge: do not we use that same pressure in correcting irregularities of the teeth?

*Dr. Peirce.*—Yes; always in moving the teeth.

*Dr. Walker.*—If this theory be true, would it not be well in extensive cases of correction to make a thorough examination of the patient before we undertake these cases?

*Dr. Peirce.*—It is very fortunate that in regulating cases our patients are invariably less than thirty years of age. This disease is not known to be developed except in very rare cases until after thirty or thirty-five years of age. I think the physicians will tell you that as a usual thing local expressions indicating the uric-acid diathesis are not established until after thirty-five or forty years, and therefore we would not be likely in our young patients for whom we correct irregularities to find any such condition.

*Dr. Walker.*—I would like to ask Dr. Jackson, who has had extensive practice in such cases, if he finds that by the movement of the teeth, either rapid or slow, that he gets this trouble?

*Dr. Jackson.*—I have not observed ill effect from moving the teeth in any case of irregularity I have corrected, although I have seen cases with extensive recession and pockets under the gums, where ligatures and rubber bands have been used by other practitioners. I may be better able to answer the question in the future, as I am now regulating the teeth for several older patients, one a lady thirty-eight years of age, for whom I am moving outward the four superior incisors which were erupted inside of the lower arch.

I have been much pleased and interested with the paper presented this evening, and think it is in the true line in which we should investigate. I am especially pleased because I have been trying to trace out the relationship of the systemic and local conditions, and have not, I find, followed the true line of investigation.

A few months since I removed three teeth from the mouth of a lady about twenty-three years of age that were so loose from pyorrhœa alveolaris that they were becoming extremely irregular and unsightly, and it was not thought advisable to correct the irregularity. A permanent fixture to retain them would have been required. On removing the teeth the roots were found to be especially short. The father of the patient is now suffering with heart and kidney trouble, and one of the sisters has pulmonary trouble and other complications. She is about twenty-two years of age. I have been interested in tracing the histories of these cases.

*Dr. Perry.*—Some time since, in reading a short paper on the subject of erosion before this Society, it may be remembered

that Dr. Bulkley in his discussion of that paper, laid great stress on the great diversity of conditions that he considered due to an excess of uric acid in the blood, or what is generally called the uric acid diathesis. Gentlemen who are more or less familiar with the drift of medical literature at the present time may have noticed that physicians are impressed by the diversity of conditions due to the excess of uric acid. This idea as applied to the teeth seems to me a very probable one. It has much to strengthen it. It is an inherited disease. I think we are all quite sure of that. We know that gouty disease is a disease of middle life or old age, and that it is an inherited condition. One or two other points confirm my notion of this. We know that gout is curable by conforming to certain hygienic conditions, although the tendency to it cannot be eradicated. It has been said that this disease of the gums is not curable, but I remember one or two cases where the condition of the mouth has been vastly improved, and there was no explanation for it except a change of condition and change of life. One patient who had this condition with three or four front teeth moved from New York and went to the interior to live. I did not see her until three or four years afterwards. When she came to me her teeth were vastly improved. They were almost well, and yet they had had no treatment during that time. She was a lady in middle life. This case would indicate that the change of scene and change of diet had benefited her, and whatever was the condition, it had been eliminated and her teeth had improved.

As far as the treatment is concerned, I think that the antiseptic treatment will be found to be the most desirable of all. It is a great point gained that Dr. Van Woert, in starting this question and Dr. Peirce in following it out so scientifically, should have put us on a new track, so that this hacking and digging at the margins of the bones will be partly checked, whatever may be the real truth of the theory.

*Dr. Starr.*—I would like to ask Professor Peirce whether he applies the term "ptyalogenic calcic pericementitis" to what we generally call "salivary calculus," where the deposits collect in great quantities and cause destruction of the teeth. If he does apply it to such cases, I would like to know the reason for giving the term "calcic pericementitis." Why not as well call it gingivitis as pericementitis?

*Dr. Peirce.*—Yes, I do so apply it. The term gingivitis would be very appropriate if the irritation were confined to the gums; but from irritation of continuity the periosteum becomes also



nvolved, and this produces an absorption of the process as well. We have the irritation of the periosteum on both sides of the process. Of course it is then absorbed very rapidly until it is all destroyed and the tooth removed. I have many cases on the table where the tooth has been removed by the encroachments of these tyalogenic or salivary deposits.

*Dr. Van Woert.*—I am more than gratified that Dr. Peirce bears me out in my statement, that necrosis is never present in this disease. My investigations have been to find the true local, and not the constitutional conditions, and am a little disappointed that he has said nothing of his treatment, and particularly did I wish to know more of his use of trichloroacetic acid, as it was from one of his writings that I first learned the value of the drug in this connection.

I am glad that there is a bright prospect of discarding the cruel and unnecessary operation of cutting, or, as Dr. Perry says, the terrible backing of the alveoli border. I have with me a few sections of bone which you will find a proof of what I said last month, and if it is your pleasure I shall be glad to pass them around for inspection.

*Dr. Jarvie.*—The etiology of this disease is certainly the most reasonable and scientific that I have listened to. It seems to accord with my own experience, as I meet with it from day to day in the mouths of patients. We have made a step in advance to-night in realizing and understanding the cause of this disease, and we will be the better able to treat it in the future. For some time I have realized that pyorrhœa alveolaris was a constitutional disease, and not a local disturbance; or rather, that the local disturbance is a manifestation of a constitutional disease. Serumic calculus is what we, as dentists, have largely to deal with as the direct cause of the loss of the teeth, and yet there is a cause beyond that, for the deposit of this serumic calculus is a result of a constitutional tendency. The paper and the discussion to-night have taken a different turn from what we heard a month ago upon this same general subject. Dr. Van Woert's paper dealt with a condition of the disease and local treatment. To-night we have gone into the cause of the disease and the constitutional treatment. Both are interesting and necessary to the proper understanding of the subject, and I cannot but feel that every gentleman in this room ought to be all the better able to treat this disease for having been present at the last two meetings of this Society. I think this is the most interesting subject we have in dentistry to-day. More teeth are

lost to our adult patients from this disease than from all other causes put together.

It ought to be a most interesting subject for us to discuss, and we ought to feel that every point of information that we can get is of great value to us. I believe we shall in a large manner overcome this disease by constitutional treatment. This is not a disease that comes on in a day, or a month, or a year, as Dr. Peirce has said. It has undoubtedly been working through the system for a long time before this manifestation is made about the teeth. It will take probably as long to treat and cure constitutionally as it does to manifest itself. It would be well if the investigation of dentists and of medical men were turned in the direction of treating pyorrhœa constitutionally. We, as dentists, can probably do much to direct the attention of the medical profession to the treatment. They do not observe the results as we do. They see the same constitutional tendency manifested in gout and in rheumatism but they do not see it in the teeth, and I believe it is manifested there much more universally among well-to-do people than it is in rheumatism or gout. In almost all cases of pyorrhœa you will find the patient of a gouty diathesis.

*Dr. Niles.*—I have been much interested in the paper of Professor Peirce and the remarks of the last speaker. I wrote a paper on the same subject about ten years ago, in the preparation of which I was able to see something of what he has proved by his experiments. I believe with him that there is a twofold deposition, first from the saliva of salts, and second from the blood or serous exudations of gum-tissue. I have never seen a deposition of lime salts on a tooth that did not have an opening from the point into the oral cavity. There are instances of musket-balls, etc., becoming encysted in the flesh. Many of our wounded soldiers in the late war have lived with balls embedded in their flesh for years; when removed they have had enormous deposits of this matter around them. I believe with the essayist and with the gentlemen who have spoken to-night, that it is a systemic condition that we especially have to deal with if we deal with the cause of the trouble. There is one point that the professor did not refer to, and that is, the possibility of the backing up of the lime salts in the system from the stoppage of the ordinary channels of excretion,—the kidneys. It has been mentioned by several writers that the salivary glands may take on themselves a vicarious action, excreting some of the excretions of the kidneys, the kidneys having become diseased, and failing in a measure to eliminate the urinary matter.



is possible this may explain in a measure the disturbances which have been mentioned to-night.

I have seen several cases since I read the paper, which have confirmed me in my opinion. One patient was operated on, I think twice, for stone in the bladder. He had about his jaws on the inside large nodules of bone-formation encircling the inner side of the maxilla. I cleaned his teeth several times, but the deposit would soon appear again. In twenty-four hours a soft deposit would cover his teeth. The man died, and Dr. Cheever, of Boston, my neighbor, performed an autopsy on his body. He found his full-bladder completely impacted, as well as stones in the bladder; his system throughout was charged with calcic and phosphatic matter.

Another point that was brought up in regard to the deposition on the teeth. I did not know that the urates were a large constituent of the deposit. I had not discovered it to so great an extent. I found that the phosphate of lime, the carbonate of lime, and the phosphate of magnesia made up a large part of this deposit, but I see no reason for supposing that the urates may not be present to the extent intimated in some cases.

I am very glad that I made the trip from Boston here, although when I planned it I did not know the subject was to be discussed. I believe we are on the right track. The manner of treatment with me has been doubtful so far as systemic treatment is concerned, from the fact that you can never make up a programme or describe a given course for this disease. It is so complicated with other troubles, and there are so many phases of it, that I am completely nonplussed where the question in its worst phases are to be dealt with. You can give Carlsbad or Lithia waters, etc., as has been recommended here to-night, which are supposed to keep these salts in circulation and assist in their elimination by the normal channels; but whether they do so or not to the extent desired I am not prepared to say. Physicians prescribe these remedies with supposed results named. There is one case in particular I would speak of, a young lady about twenty-four years old I treated about ten years ago, where the disease was cured and the teeth became absolutely firm. The patient says I cured the trouble, but I noticed other changes not local. There was a change in her general health for the better. I simply removed the local deposits on the teeth, and the circulation of her system changed from other causes for the better. She has kept her teeth, and they are doing good service to-day.

*Dr. Bogue.*—Dr. Michaels, of Paris, noticed that some warm water which he had in his office standing over a gas-burner collected a thicker deposit of lime at the point where the flame was than anywhere else. Acting upon this incident he made a number of experiments, and the result was this hypothesis: that the deposition of salivary calculus is largely dependent upon the elevation in temperature of the parts involved. A very slight elevation caused by inflammation suffices to cause fluids impregnated with lime to deposit this lime.

I simply repeat Dr. Michaels's statements, but they fit in precisely with what has been said this evening. Here is an observer several thousand miles away, who by his own processes has reached much the same conclusions as are hinted at by Dr. Jarvie.

*Dr. Perry.*—My faith is growing stronger and stronger as to the cause of erosion. I want to relate the case of a lady who came to me from abroad, an old patient of mine, I think probably six months ago. I said to her instantly, "You have an excess of uric acid." She said she had not been well at all. She had neuralgia and pains in her bones and joints, and she was nervous and depressed and all out of sorts in every way. All the physicians to whom she had gone had not been able to find any cause. I said, "I am sure there is an excess of uric acid in your system. Just suggest it to your physician." I wish the gentlemen present could hear what she said to me last week in reference to what had been done for her after giving her physician that hint. She said she was a reformed woman in regard to health, and that life was worth living.

*Dr. Niles.*—I want to speak of one condition, and that is, the absence in some cases of the deposit. I have never been able to ascertain whether the deposit might not have been there at the inception of the trouble, and the chemical conditions becoming so altered to an acid condition that a deposit could not form. Has this occurred to any gentleman present?

*Dr. Perry.*—I hope we will not pass an ordinary vote of thanks to Dr. Peirce for reading this paper. If we do, I hope some gratification will be felt, if not expressed, that as the years go on he still retains his boyish enthusiasm and his interest in science. It was worth coming farther than from Boston to New York to hear this paper. It was worth going from here to Chicago. I will put my remarks in the form of a resolution.

Resolution unanimously carried.

*Dr. Peirce.*—I have had special gratification in being with you

this evening. My work is not finished. It is just beginning. The opportunity that lies before us all is very important. One swallow does not make a summer, as you know, nor are the experiments of one individual sufficient to establish an hypothesis. We need to have scores of teeth examined, and these results confirmed, before we can start in on a sure basis. I have planned to occupy the winter with further investigations, for I feel that I am on the right track. It has been a pleasure to me to-night to have such a hearty response to my immature paper.

*Dr. Jarvie.*—I think a word at this time would be very appropriate. A month ago we had a paper from Dr. Van Woert on the subject of pyorrhœa alveolaris. We have had this paper from Dr. Peirce to-night, and in it he stated he had some further experiments under way. I wonder if we could not pre-empt the results of these experiments and have this matter go out before the public as coming from us. For the sake of the cause this would be wise. The effect would be better than if the papers and discussions were scattered among different bodies. I know Professor Peirce has his affiliations in Philadelphia, but possibly he might be prevailed upon to read the result of the further investigations before this Society, and we will try to make the assembly as representative of the dental profession as we can, and not confine it merely to that part that is in New York.

*Dr. Peirce.*—You must remember that a year ago I read a paper before the Odontological Society of Pennsylvania, and they may feel that it is a little infringement on their rights for me to bring this paper here to-night. I presume the subsequent investigations will probably be more needed there than here. Some Philadelphians are much averse to the theory advanced this evening, and the next paper when ready will, I think, be read in Philadelphia if at all welcome. If I am to judge from your criticisms, which have all been so kindly and considerate, it will there be most appropriate.

Adjourned.

JOHN I. HART, D.D.S.,  
*Editor New York Odontological Society.*

## HARVARD ODONTOLOGICAL SOCIETY.

A MONTHLY meeting of the Harvard Odontological Society was held on Thursday evening, September 28, 1893, at Young's Hotel, Boston, with the President, Dr. Eddy, in the chair.

*President Eddy.*—It gives me great pleasure to announce that we are once more permitted to open our ranks to one of our former active fellows, and we shall surely give a hearty welcome to Dr. Charles H. Taft, of Chicago, who will read a paper entitled "Injurious Effects of Amalgam Fillings."

(For Dr. Taft's paper, see page 81.)

## DISCUSSION.

*Dr. Briggs.*—This is a question of great interest to us, and has been the subject of controversy for years. Though a physician myself, I have always recognized the position the general practitioner holds as being superior to my position as a specialist, and I have taken the stand towards amalgam fillings that if the family physicians believed it was not a good thing for their patients to have them, I was perfectly willing to take them out, at the same time declaring my own belief in the matter and feeling that they were perfectly safe.

This question, it seems to me, is a very hard one to decide. One has to begin by being a believer in the Hahnemannian theory. The question of this fine division of drugs is what the whole matter hinges on. If one accepts this theory, he must accept the fact that amalgam fillings are dangerous. Not being a follower of Hahnemann, I do not accept that theory. Then the question of procedure comes in, and that is a very difficult thing to decide. Dr. Taft has seen cases where by taking out the fillings it has produced a cure. He does not exactly make the statement that amalgam fillings are poisonous,—only that in perhaps the majority of cases they interfere with drugs given according to Hahnemann's theory. My personal experience, and perhaps that of every dentist, is that I have seen no direct results from amalgam fillings,—that is, no cases in which I thought the amalgams in a patient's mouth have been doing any injury. I have been requested sometimes not to put them in, and have always acceded and followed that instruction. I have always been conservative in regard to amalgam, never having used it when I just as well could use some other material. Dr. Taft, when he went away, left behind him a great many cases

where he had inserted amalgam fillings. It has been my privilege to see some of them since he has left, and I can only testify that he seems to have done great work in preserving teeth by the methods he followed.

What I would like to get at for my own edification and satisfaction is to prove that these things do the harm that is claimed, but it seems to me it is very hard for us to come to a point where we can meet on even ground, understanding as we do that it opens up the question of faith. I once asked a gentleman who was a chemist if any chemist did believe in Hahnemann. He said, "Yes;" and I asked him how they reconciled the two theories, and he said, "When they accept Hahnemann they drop their chemical knowledge and follow faith." That, of course, was a point of view from an unbeliever.

I would like to ask Dr. Taft what proof have we, other than in the cure of disease, that there is power in those high potencies of medicine, and when I say that I mean to put a great deal of stress on the one point, the *curing* of disease. Statistics show that disease is cured under all sorts of conditions. We know that the faith-cure, the Christian scientist, and any follower of any kind of medicine, can show a great many cures, and remarkable ones, and yet we are not prepared, when a woman says that she went to this Christian scientist, went sick and came away well,—we are hardly prepared to follow that particular creed. When we go to Montreal, in the cathedral there we hear stories of people who have come there lame and diseased and have thrown away their crutches and departed cured, but you would not ask us to believe that that is the best system of medicine to believe in. What I want to get at is the scientific solution of this question. I want enlightenment. I mean by that I would like to be convinced of anything that is going to help me to give my patients that service which is for their best interests, and we have men here to-night who seem to be fully equipped to explain this matter to us.

*Dr. Kimball.*—I do not wish to discuss the homœopathic law of cure, but simply to relate a few cases. In regard to chemistry, it may not be generally known that Hahnemann was one of the greatest chemists of his day, which fact ought to dispose of the question of the incompatibility of chemistry and homœopathy.

Speaking of the case that Dr. Taft detailed to some extent, the gentleman was a patient of mine. He had been under my care about a year and a half. His mouth was full of amalgam fillings. He was engaged in study at college and was constantly afflicted

with sick headaches and seminal discharges at night, and was generally in a debilitated condition. I prescribed for him as carefully as I could from the symptoms presented, but the medicines did not seem to take effect. After the fillings were removed the change was marked and striking. He was able to work harder. He went through the Harvard school, where he was studying, very successfully and gained about twenty pounds in flesh, and now is able to do hospital work, night work, without any recurrence of his former trouble. This change, of course, cannot be placed to my credit alone, because the same remedies that were used before were used afterwards.

There was one case that I know of where no remedy was used at all, but the amalgam fillings were removed. The case was reported to me by a lady physician. A young girl, about eighteen years of age, came to her suffering from painful menstruation and a coryza during the menses. Formerly that function had been perfectly normal. She asked her how long that disturbance had been going on, and the reply was for several months. The physician was interested in this matter of amalgam fillings, and she asked the patient if she had any, and she said yes; some were put in about six months before, two months before the trouble began. She thought this would be a favorable opportunity to test the efficacy of removing them without giving any remedy, and told her to have the amalgam fillings removed and that she would not give her any medicine. There was no coryza the first month, but there was some pain; the second month there was no pain and no coryza, and there has been none since. That case is worth much more than cases in which remedies have been used.

Another case was one of Dr. Thurston's. I am sorry he is not able to be present to-night on account of sickness. The patient was a lady who was a great sufferer from nervous prostration and had been under the treatment of skilful physicians. Dr. Thurston noticed that she had a large number of amalgam fillings, which he advised her to have removed, and a marked change in her health was soon manifested, and she went on to a complete cure. I have one case of chronic nasal catarrh in which the removal of the amalgams has been of decided benefit, and indeed I am firmly of the opinion that chronic cases cannot be properly treated without removing the amalgams, and I am very unwilling to undertake a case without having them removed.

Of course we treat patients with amalgam fillings and get very good results, and in cases where we do not, it is possible that we



may not prescribe correctly for them ; at the same time, the effect of the mercury undoubtedly either has an injurious effect upon the system, as is evident in some cases, or it prevents the remedies from having the desired effect.

There was an extremely interesting case of a man who came from Australia and went to London and put himself under the care of an able physician there for a stomach trouble, a troublesome indigestion which had continued for years, and from which he could only obtain temporary relief. This man treated him for a year and admitted that he could do nothing for him, but he advised him to go to a certain physician in Brooklyn, who, he said, could cure him if any one could. He came over, and the Brooklyn physician, who tells the story, after hearing the history of the case, concluded there must be something operating as a bar to the cure. He examined his teeth and found a large number of amalgam fillings; he had them all removed, and immediately the man recovered from his trouble, and at the last accounts had had no return.

From these facts, I think if we meet with any difficulty in curing troubles of the throat or the stomach, diseases of the nervous system, painful menstruation and coryza, it would be well to see what effect it would have to remove the amalgam fillings.

*Dr. Briggs.*—If you will allow me just a minute, Mr. President? There is one thing that physicians do not and which every dentist does know, and that is that there is no work that is done in such a slovenly manner as the majority of work in amalgam. You will often find, after slovenly operators, overhanging fillings and fillings put away so as to cause great local irritation, and do you always recognize that factor? You know what trouble you can get from the reflex action of a slight irritation, and if you would recognize the tremendous irritation that is going on in that mouth you could then account for any lack of effect from the medicine, and of course, if you take those fillings out and remove all that irritation, you would very naturally find an improvement. A great many times, I don't say in every case, you would find that the local irritation from these slovenly-made fillings would be the sole cause of troubles located in any part of the body.

*Dr. Kimball.*—The amalgams in the mouths that I examined seemed to be particularly well put in ; the teeth seemed to be well cared for, and the patients were intelligent people who would be apt to notice local irritations.

*Dr. Briggs.*—Intelligent people do not always go to good dentists.

*Dr. Kennedy.*—I have been interested in what has been said thus

far. I was much interested in the paper and confess the essay introduced more homœopathy than I thought he would, in which however, I am thankful to say I am interested. I like the sentiment voiced by Dr. Briggs, that men are ready to investigate. I believe that is right. Let us investigate, and if I understand it rightly, the purpose of Dr. Taft's paper is largely that it may stimulate you up to investigate for yourselves.

Now, I am not here to discuss the matter, much less to prove to you, or to demonstrate to you beyond any question, that injurious effects result from amalgam fillings. I simply come in here to testify to what I have observed, and I believe that is the thing to do. We should cultivate the habit of observation, for by it we learn many valuable truths. I do not think any less of a man because he differs from me, and I wouldn't give anything for a man who is not sceptical at times. One is very naturally sceptical concerning a thing of which he knows very little.

Now, there are two or three points here I want to refer to. In the first place, in regard to the treatment of chronic cases, where the treatment extends over a month or several months and sometimes a year. In speaking of this Dr. Taft says we are not to accept it because he says so, and I like that. I do not expect you to accept it because I assert it. I stand here and say that it is my conviction that amalgam fillings do affect some patients, —not all, or at least to that extent that we can observe it, but that it does decidedly affect some people I am most positive in my belief.

Dr. Briggs has said that he yields to the physician, and if the physician requests that amalgam fillings be removed, he acquiesces in that, and yet expresses his sceptical views on the subject. I have found a similar experience, as I have sent patients to dentists to have amalgam fillings removed, and the dentist would ask, "What crank have you for a physician? Of course, if he says so, I will do it."

I do not quite think that it is necessary to believe in homœopathy to become convinced that amalgam fillings are injurious. It is by observation that we can learn facts, and in order to give you some of the facts that I have observed and not prolong my remarks, I will mention a few cases that have come to my knowledge.

One was that of a clergyman who was troubled with his throat, which was very sensitive and repeatedly became inflamed, so much so that he was unable to go on with his professional work, and he spent thousands of dollars in this country and other countries trying to get rid of his trouble. Some one discovered that he had



amalgam fillings in his mouth and advised their removal, and he recovered rapidly.

Another one, treated by a physician in this city, was that of a servant who had an ulcer on the inside of the cheek. The doctor gave her several prescriptions without any satisfactory result, and could not understand why his medicine had no effect. Noticing one day that directly opposite the ulcer was a tooth filled with amalgam, he said to her that she must have that filling removed. The servant went to a dentist, who removed the filling, and immediately she began to improve without further treatment.

Another case was that of a lady in this city,—an artist, who had been subject to attacks of sore throat, such as tonsillitis, laryngitis, and other affections, at frequent intervals extending over a period of twenty years. She came at length under the care of a physician who was a careful prescriber, but, do the best he could, he found there was something that prevented the action of the remedies,—certainly the treatment was very unsatisfactory in its results. Noticing that she had amalgam fillings, he told her that it might help her if she had them removed. She did so, and without any further treatment she began to recover from the feelings that she had thought were a part of her daily life. She has since that scarcely had a sore throat, and it is now a year and a half ago. I know the lady personally, and she will state the same to you at any time.

Another was a case of my own, of a lady who was troubled almost continuously with tonsillitis, pharyngitis, laryngitis, affections of the vocal chords, and more or less cough accompanying. I treated her for some time and studied her case faithfully. I would relieve her to a certain extent, but the trouble would soon return, and the results were very unsatisfactory. I then ordered the removal of some amalgam fillings. That was about three years ago, and I have given her but two or three prescriptions since. She removed about that time from Massachusetts to New Hampshire. Possibly the change may have resulted in this case from the difference in climate.

Last, but not least, at any rate not of the least interest to me, is my personal experience. I went last spring to my dentist and told him that I would like to have him remove the amalgam fillings in my teeth. He looked at them and said, "They are all right; they appear to be good and solid. What do you want them taken out for?" I replied, "I do not wish them in there. They may be all right, but I am satisfied they sometimes do harm in the mouths

of patients. It is possible they may not affect me, but I wish them removed." So he took them out. To my surprise, within three weeks I began to notice a change in my digestion, which had troubled me for a dozen years, ever since I had had the amalgam fillings. After eating certain articles of food I would invariably have an attack, more or less severe, of what is commonly called heartburn,—a very disagreeable feeling. I have had very little since and have taken much less treatment for it. Furthermore, whenever I take a remedy now it acts far more promptly and effectively than formerly.

Now, these are points to which I am glad to bear testimony as the result of my observations. I do not expect that they will prove to you that amalgam fillings are injurious, but I hope they may tend to interest you to the extent that you will watch and investigate for yourselves.

*Dr. Hitchcock.*—Dr. Kennedy's remarks convince me that possibly I gave a patient a wrong treatment. A lady had two amalgam fillings in her mouth, and one of them, in the second upper molar, was loose, with redness about the gum and more or less coryza. According to the theory of the essayist, she may have been affected more or less dynamically by the filling, but after looking it over I decided that the inflammation of the gum was caused by the amalgam pressing against it, and was increased by her picking at it and trying to remove it. Now, from what has been said the filling should have been removed and some other material used, but the amalgam filling was simply trimmed, and there has been no trouble since.

Neither Dr. Taft nor Dr. Kennedy has told us what is the exact effect of mercury on the system. I have here the provings of mercurius; let me read: "The teeth feel loose, fall out. Toothache from caries or when the dentine is inflamed; returns in damp weather or evening air; pains tearing, lacerating, shooting into face and ears; worse from warmth of bed, from cold or warm things; better from rubbing the cheek. Gum painful to touch, swollen, receding from the teeth; edges whitish, bleeding; fetid odor from the mouth; ulcers with dark-red edges. Pulsating toothache worse at night; gum-boil."

"It is equally certain that Hahnemann himself admits the general aggravation of disease by homœopathic doses when administered in sensible quantities."

Now, to find out about this, let us give these medicines when there is reason to think that the patient is being affected by amal-

amalgam fillings,—it will do no harm. One thing surprises me,—namely, that gold is an antidote for mercury. How do the gentlemen get over this point? If gold is an antidote for mercury, then the gold fillings in the mouth would counteract the effect of the mercury, and the amalgam fillings would produce no ill effects.

I was talking at my home with a physician who laid more stress on the copper than on the mercury in amalgams. I find in looking over the Pharmacopœia that alum, arsenic, gold, belladonna, bismuth, borax, bromides, calcium, phosphorus, camphor, cannabis indica, cinchona, copper, sulphur, and many others produce provings on the teeth.

The way to prove this and find out who is right is for us to take a few of these remedies and try them. Then notice whether or not we get these mercurial provings. We can certainly get a larger dose of mercury into our system by mixing the amalgam in our hands than from a filling in the tooth; they have given us no examples of dentists being affected by it, though they are using amalgam almost daily. Why do we not produce these effects on all our patients by the mouth-mirror, which is coated with mercury?

*Dr. Allen.*—Those are old-fashioned mouth-mirrors, doctor; they are now lined with nitrate of silver.

*Dr. Hitchcock.*—That is just as bad. I have the provings right here. There are cases in which people are so sensitive to different metals that they cannot carry a silver or gold coin, or even a copper, in their pocket. To such a person coins will produce bad feelings in the head until removed from the pocket. You have heard of persons who when blindfolded can step on a coin and tell what kind of metal it is.

Why are we so afraid of putting silver fillings into a dead tooth? It seems to me that is the best treatment we could give.

*Dr. Kennedy* speaks of the indigestion which was relieved by the removal of the amalgam fillings. I have been troubled similarly, and have found relief by taking a little nux vomica, but there is no amalgam in my mouth.

*Dr. Kennedy.*—While having the amalgam fillings in my mouth the nux vomica didn't relieve me, but I have had occasion to take it since, and the relief could be noticed at once.

*Dr. Hitchcock.*—In speaking of a potency, you take one drop of the original drug and add ten drops of alcohol or water to it, then take one drop of the latter and add ten more, making one drop in a hundred for the second potency, do you not?

*Dr. Kimball.*—Potentiation is a development of force. The

original drop, by the process of shaking and mixing which it undergoes, medicates the whole one hundred drops; a drop of this medicates the next hundred, and so on. It is the same as with the magnet. You can take a magnet and magnetize one thousand magnets with it, and those magnets will become one thousand times as strong as the first one, and yet it will have lost none of its power.

*Dr. Hitchcock.*—That is not a parallel case, but isn't that the proportion, one drop in a hundred?

*Dr. Kimball.*—It is not the same as the dilution of a remedy. By this process the more you get rid of the material the more you develop the curative properties. The medicinal value is increased with every dilution.

*Dr. Hitchcock.*—For your general practice what is the highest potency given?

*Dr. Kimball.*—We find that we get the best results with medicines ranging from the thirtieth to the one-hundred-thousandth potency. Now, to show you that there is an efficacy even in the one-thousandth potency, you will permit me to relate an incident even if it does not pertain to this discussion.

A great many people are opposed to vaccination with the cow virus, and undoubtedly a great many children are killed with the best virus that can be obtained. Now, for an experiment, and I have done it twice within the last six months, once not later than three weeks ago, instead of vaccinating, I have given two powders of the one-thousandth potency of variolinum to a child ten years old, one at night and one in the morning, and within a week there were twenty umbilicated vesicles over its body, some as large as half the finger-nail, and when examined they exhibited the characteristic of the vaccine pustule. With such examples as this, we are compelled to think that there is some efficacy even in the high potencies.

*Dr. Hitchcock.*—I have been doing figuring a little, and find that the proportion of the original drug in the fifteenth dilution is one drop in 258,539,691 hogsheads.

*Dr. Smith.*—I assume that physicians know the manner in which these amalgam fillings are made, and I would like to ask what is their explanation of its effect upon the system? In the properly prepared amalgam filling a very small amount of mercury is used, and I would like to know how it affects the patient,—in what form?

*Dr. Stanton.*—I would suggest that Dr. Taft, being a dentist, could perhaps answer that question more intelligently.

*Dr. Taft.*—It gets into and affects the system in just the same

say that the arsenic does in the wall-paper; you cannot tell just how that force, which is also a dynamic one, is doing its work upon one who spends considerable time in the room. That it does you have positive evidence in the unmistakable symptoms produced of arsenical poisoning. The question of potency in this matter is a very small one, and really cuts no figure in the point at issue. It is the dynamic action of the mercury that we have to consider, and knowing that it is such a deep-seated, deep-acting drug, we should be very careful how we expose our patients to its action.

I know it is very difficult for some men to accept the idea that there can be any symptoms produced upon a healthy person simulating symptoms of a disease from the administration of the one-hundred-thousandth or a much lower potency of a certain drug, but they can satisfy themselves of this fact by trying the different potencies on themselves or on other persons in health and noticing the effects. You will not have any difficulty in getting provings. If there is any law underlying the art of healing, the only way to get at it is to study the action of drugs upon a healthy person, and, as I suggested in the paper, if you will try these things for yourselves you will get all the evidence you care for.

*Dr. Smith.*—I think that the statistics, if you could get them, of the results obtained from the use of amalgam fillings would settle this question as to injurious effects. Amalgam may be guilty of all this poisoning, but it is not yet proved. And if we get dangerous effects from the small amount of mercury in the amalgam filling, why should we not expect it in the cement fillings, which also contain a powerful drug?

I will mention a case which might be claimed would tend to show an entirely opposite effect from amalgam fillings. A young lady in poor health had been in my hands a number of years. I had never used amalgam in the treatment of her teeth. I use but very little amalgam in my practice, and never in cases that I know are patients of homœopathic physicians. She was at that time under the treatment of a prominent homœopathic physician. Later she went on a visit to New York. What her trouble was of course I know not; and I think she was under the same treatment by the same physician while spending the winter in New York. In the summer she came into my hands again, and, much to my surprise, a dentist there had placed several amalgam fillings in her teeth, probably unknown to her; and so the lady for whom I had purposely avoided putting in amalgams came to me with these fillings in her mouth, but with her health perfectly restored. Now, if we

can have a few more cases like that, cannot we just as well come to the conclusion that amalgam fillings are beneficial to the health? This is only one case that has come into my practice. Perhaps it would be unsafe, from the homœopathic stand-point, to experiment in this way, but as we seem to be in the line of experiments, would it not be well to put two or three amalgam fillings into the mouth of a person in poor health and under homœopathic treatment and see what the result would be? I do not see yet sufficient proof to warrant me in believing that amalgams are injurious. A majority of the people have amalgam fillings, and while I do not know the statistics, I fancy their general health will compare favorably with the richer class, who have mostly gold, oxyphosphate, or gutta-percha fillings, and few, if any, amalgam.

*Dr. Briggs.*—I spoke of the irritation of amalgam fillings purely from a mechanical point of view. Another source of irritation might be found in badly mixed amalgam fillings wearing away and being dissolved, especially in cases since the rage for copper amalgam came in. I cannot but feel that it is a very dangerous thing for copper to be taken into the system in quantities in such quantities in the mouth as that spoken of. If you intend to put them in, put them in and cover them with gold, or they will wash away and the supply of copper may be taken into the system. I would like to ask Dr. Taft if he considers that an amalgam filling covered with gold would have any power for harm in the mouth?

*Dr. Taft.*—That question has come up with me several times in my practice during the year, and I have discussed it with my colleagues as to whether there was a possibility of the system being affected by the mercury which might enter it through the tubules. I feel that there hardly can be, and yet I consider it is safer not to use amalgam in combination fillings, even in crown cavities. You can cover the floor of a cavity with cement and then finish with gold just as easily, and it makes a better lining for the centre of the tooth than amalgam, and for myself I prefer not to take all the chances on the amalgam.

I only want to speak of just one other case among the many that I have had this year. A young lady came to me from the dean of the college with which I am connected to have all her amalgams removed. She was a girl of very delicate health, had several large amalgams, and was troubled with chronic catarrh. She had not been improving in health at all, and upon advice of the dean I removed the fillings. She began to improve at once, and the next time she came she said she felt very much better.



any way, and at a subsequent sitting there was not a trace of the arrh left in her breath, which had previously been very offensive. I have noticed during the past year a very steady and often rapid improvement, especially in patients troubled with chronic arrh, chronic headaches, and chronic neuralgia, from whose mouths I have removed all amalgam fillings.

*Dr. Smith.*—The hour is getting late, and I would move that the discussion of this subject be extended to the next meeting.

Motion passed.

*Dr. Smith.*—I would further move that the Executive Committee be instructed to invite the homœopathic physicians who have been with us this evening, and others interested in this subject, to meet with us at our next meeting.

Carried.

The meeting was then adjourned.

HENRY L. UPHAM, D.M.D.,  
*Editor Harvard Odontological Society.*

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## Editorial.

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### ARE OUR DENTAL ORGANIZATIONS SATISFACTORY?

THE history of dental organizations throughout the world is, probably, very much the same, and it is presumed the record, if such exists, would show that the various bodies have originated through the aggregation of individuals without much or any attempt at classification. In some local societies, of latter years, a certain qualification is demanded, as a diploma from a recognized college or a medical degree. While this condition is an advance on previous loose methods, it does not seem to have helped very much the outcome, for, as a rule, results have by no means been equal to expectations.

Organizations in dentistry have from the beginning followed set lines. The custom adopted from time immemorial in the medical ranks has been the example followed, and that with a persistence that must be regarded as strange, when it is remembered that dentistry arose independently, and should have marked its own path and refused to be a mere copyist of the work of other men and other professions. It was original in most things, but in

this respect it began exactly with the old methods, and has not made any marked advance since the first organization was completed.

Less than sixty years ago there was not a dental organization on this continent, the first formed being in New York in 1837. It is true that Dr. Hayden urged the idea as early as 1817, but there was no response to his efforts, and those who can recall the condition of dentistry as late as 1837 can only wonder that at that period any kind of an organization was possible. The dentists of that time surrounded themselves with a wall of exclusion, every man being practically at war with every other man in the practice of dentistry. It is, therefore, not surprising that the two original societies in New York died and left no history.

In 1840 the American Society of Dental Surgeons was organized with Dr. Hayden as President. From that period until the formation of the American Dental Association in 1855 there were but five associations organized,—the Virginia Society of Surgeon Dentists in 1842, the Mississippi Valley Association of Dental Surgeons in 1844, the Pennsylvania Association of Dental Surgeons, the Society of Dental Surgeons of the State of New York, and the successor of the American Society of Dental Surgeons, the American Dental Convention, organized in 1855. It would be difficult to number the local State and National Associations existing to-day, but except in minor matters they exhibit no improvement in their manner of work over those first called into being.

This would seem not to be on the line of progress. It is certainly true that dentistry has made marked advances in the period named. It has progressed very nearly to the standard of a learned profession, and its methods of legislation on scientific lines should have advanced with a proportionate rapidity.

It may truly be said that the work of building up the theoretical and practical details has been too exacting to permit of any originality in other directions. While this is acknowledged it will not much longer be a valid excuse. The imperfections now existing in society work will continue unless there be an effort made to change conditions and means of labor.

It is certainly true that while dental organizations have been of inestimable value in binding together and liberalizing the incongruous elements engaged in the practice of dentistry, and have proved most valuable incentives to scientific work, the real progress of dentistry is exclusively due to the work of individuals and largely independent of any society efforts.



There has been no attempt made, so far as we are aware, to crystallize this isolated scientific element into one body. It remains as it began, without organization and often without encouragement.

The evolution of societies throughout the United States presents a curious state of affairs. They may be classed as local, State, and national. In many sections of the country a practitioner must travel hundreds of miles to attend a meeting, and in other and more populous districts, as large cities, two and frequently three societies are found working with more or less success.

In the entire aggregation there is no system, if we exclude the State of New York. A few men get together and form a local society; a few more from different sections of a State organize a State society; a larger number from the nation develop a national organization. The local society may or may not require the degree of admission. The chords of fraternal labor are drawn closer here than elsewhere, hence we find that local societies practically perform all the real scientific work of the profession.

It is difficult at this date to determine why State organizations have ever been deemed a necessity. It is presumed they originated under the idea that each State must be independent of every other State in the confederacy. It is certain that results do not warrant any great efforts for their continuance as a working part of the profession. While these profess to represent the associations of the various Commonwealths, they generally retain that odious cause of permanent membership in their constitutions similar to that of the National Association, than which there is nothing more fatal to representative character or scientific work.

When it is remembered that in eight of the States of the United States these irresponsible bodies have the nomination or appointment of the State Boards of Examiners, and in one State they appoint the majority of the Board, it seems as though the time had come for a reorganization in all directions, but especially should there be a change in the anomalous condition of State matters.

The attachment felt for the organizations supposed to represent the largest constituencies, the American Dental Association and the Southern Dental Association, make it a difficult task to effect any change there, but it must be evident to the members that the work performed by these Associations bears no relation to the expenditure of time and means for their maintenance. It will hardly be asserted that either of them have accomplished much scientific work. In the American there has been a notable and worthy effort in the past three or four years in this direction, but every attempt

there is hampered by an unwieldy organization, and in the end all results are attained by individual efforts.

The most convincing example of herculean effort without a corresponding equivalent in results has recently been given the world in the Columbian Dental Congress. It demonstrated, as never before, that it is impossible to bring masses of professional men together and in this way advance the standard of scientific knowledge. If dentistry is to develop beyond its present state other means must be adopted, and we think the time is propitious for at least a discussion and comparison of views as to the best means to accomplish more with less use of dead material.

We think it must be conceded that the local societies, as now constituted, are, probably, the best form of organization, as they come closest to the individual. The State associations should be relegated to oblivion, as they can give no reasonable excuse for their existence. The national organizations should be remodelled on strictly scientific lines or be dropped altogether as having outlived their usefulness.

While the writer of this does not feel it his duty, even if he were competent, to suggest plans for reorganization, it may not be construed as out of place to offer a personal opinion.

If the individual is to be the unit in scientific investigation, the local society should be the basis of his support. These should be the feeders to a national organization, and there should be nothing between these two bodies.

Representation from the local to the national should be based solely on original work. Mere membership should have no weight in the selection. The national body would then be composed of a limited number, but all would be original thinkers. In this body a similar rule should be enforced compelling a member, during his continuance as a delegate, to present one or more truly original papers upon subjects worked up in the laboratory and not in the brain of the writer. The influence of such an organization cannot be computed. It would in a very brief period change the whole current of thought and challenge the respect of the world.

We do not propose to work out the details of such an organization. To many, doubtless, it will seem utopian, but in the view of the writer of this it must be the organization of the future, and it seems to him that it is the duty of all interested in the scientific well-being of our profession to work up towards it, and, in any event, leave time-worn roads for a more direct avenue to the Temple of Knowledge.

## DR. HARLAN RETIRES.

THE January number of the *Dental Review*, Chicago, announces the retirement of Dr. Harlan as editor of that journal.

This is a serious loss to our contemporary, as it has been largely through his ability and untiring energy that has made this one of the best of the trade journals.

Dr. C. N. Johnson has been placed in the position vacated by Dr. Harlan. He has been connected for some time with the *Review* as assistant editor. Drs. T. L. Gilmer and George J. Dennis will aid as associate editors.

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## Bibliography.

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DISEASES AND INJURIES OF THE TEETH, INCLUDING PATHOLOGY AND TREATMENT. A Manual of Practical Dentistry for Students and Practitioners. By Morton Smale, M.R.C.S., L.S.A., L.D.S., Dental Surgeon to St. Mary's Hospital, Dean of the School, Dental Hospital of London, etc., and J. F. Colyer, L.R.C.P., M.R.C.S., L.D.S., Assistant Dental Surgeon to Charing Cross Hospital, etc. Longman, Green & Co., London and New York, 1893.

This volume of four hundred and twenty-three pages is a welcome addition to the list of books relating to dentistry. A practical work on dental pathology has been long needed. Several very valuable contributions have been published from time to time of more or less ability, but they have not met the pressing need of students for a text-book or manual covering all the essential facts and yet not omitting detailed thoroughness in description. This book by Drs. Smale and Colyer comes nearer filling this want than any yet published, but while it is prepared with marked ability on the scientific side of each question discussed, it fails to enter into details on most of the practical points. This mental twist, so to speak, has been noticed before in books issued in England, and it is this which has made it impossible to use them with any advantage on this side of the ocean.

This is less open to objection than any issued from the English

press, and if before it reaches a second edition changes are made to bring it more nearly in line with the daily practical work of students, it will hold a very important place among the text-books.

The work opens with a chapter on first dentition, followed by twenty-two chapters covering nearly all the subjects embraced under what is generally understood as dental pathology.

Very curiously, the "Introduction," in connection with other subjects, takes up the question of fees. "The question of fee is always a difficult one to write about, but . . . the dental surgeon is not selling materials, whether for operative or mechanical dentistry. Whatever fee he may elect to name should be for his skill and experience."

This sentiment will, probably, be cordially endorsed everywhere.

The chapters on "Dentition," I. and III., are, as a whole, well prepared and satisfactorily illustrated, but there are some points not well described. The remark that "*Local disturbances accompanying eruption of the permanent teeth*" are mainly confined to the third molars may be passed over with the remark that facts do not sustain it, as it is not unusual to have serious reflex disturbance from the second molar, and good reasons could be given why this should be so.

The paragraphs relating to the third molar are so surprisingly defective in statement that the reviewer is astonished that the authors should have been willing to have it go out to the world that this is all they could say on this important topic. The eruption of the third molar with its possible three important malpositions should be given more than a page and a half in a book such as this. The treatment is good as far as it goes, but as a whole is not satisfactory.

Pericementitis is fairly well described, but in the treatment the conditions pre-existing in the pulp-canal are entirely ignored. That these are the cause and must precede all apical pericementitis is clearly understood, and should have been made clear in the text. It is the old story of counter-irritation and systemic treatment, leaving out the principal factor in the inflammation.

The same criticism applies to pyorrhœa alveolaris. It could hardly be expected that the treatment given should be a success, but then this is by no means peculiar to this book or to England. The complaint is universal, "We cannot cure this disease;" yet some do; why this difference?

In the devitalization of the pulp the authors follow recognized procedures, but seem to have failed to recognize the fact that



hyperæmia present will prevent absorption of arsenic and produce violent pain. They present no method to meet this, in fact do not mention it as a possible contingency.

The chapter on "Caries" is most excellently prepared. The subject-matter is well stated, and the photo-micrographs beautifully exhibit the entire process. Indeed, we have rarely seen them better done.

We have not space to follow the authors throughout their work, nor have we any wish to be thought hypercritical. The desire has been that by calling attention to some defects a remedy may be applied before a second edition is presented. We can say of this book as we can of no other with which we are familiar, that with the changes suggested it would be the most satisfactory in dental pathology yet presented as a text-book.

The practice of sending a book out with the leaves uncut is simply detestable. This may be "good form" in England, but it is certainly sure not to be commended in America, where time counts for a great deal.

In other respects the publishers have spared no pains or expense in producing the work in the best manner.

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## Obituary.

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### DR. DANIEL NEALL.

DANIEL NEALL departed from this life January 6, 1894, aged seventy-seven years.

The gradual passing from the active scenes of earth of many of the earliest workers in dentistry should lead those who are left to entertain the serious reflection that the bonds which have for so long a period united this generation with the past are being rapidly severed.

Daniel Neall was contemporary with Maynard, Harris, Westcott, Arthur, Townsend, and the untiring host of original thinkers who made dentistry what it is to-day. He labored with all of these that it should be assured of a foundation upon which to erect a superstructure honorable to all who practised it. While he thus

actively worked he shunned publicity, preferring modest retirement. Yet his influence was deeply felt in the professional circle which he moved.

He came from sturdy, uncompromising Quaker stock. His father began the practice of dentistry when the subject of this sketch was quite a boy, and consequently it may be truly said that his entire business life was spent in dental work.

Daniel Neall, Sr., was among the earliest of the practitioners in Philadelphia, and while Plantou has the credit of introducing porcelain teeth in America in that city, Dr. Neall, the elder, greatly improved on the work. It was the writer's privilege to see a good deal of his block-work as early as 1837, and, while markedly inferior to that of Wildman of a later period, it effectively accomplished the purpose intended.

The son inherited a taste for the mechanical side of the profession, but devoted himself principally to the operative branch, which he excelled. While his work was marked with skill, it is questionable whether he ever fully adopted modern methods. He was strictly an operator of the old school, but one of the very best in his class, and few could excel him at the present time.

He early became a member of the Pennsylvania Association of Dental Surgeons, and was an active participant in its proceedings. He was also an active member in the Odontological Society of Pennsylvania.

For some years he was a member of the Board of Trustees of the Pennsylvania College of Dental Surgery. While, theoretically, an earnest advocate for advanced educational methods, with this exception he abstained from active participation in the work. His view, if the writer understood him correctly, was, that a man in active practice could not teach and do justice to his patients. He was conservative in many directions and broad in others,—a very common condition with men of positive temperament.

Very few persons possessed greater conversational powers. He was the life of the social circle, and his membership with the Philadelphia Dental Club, a social organization, will long be remembered by those connected with it.

His health was much broken for several years, preventing him from practice, but when he returned to it he probably found but a little change in the number of his clientele. The devotion shown to him is rare, but in this case it was founded on a true love for the man.

His funeral was largely attended, and, doubtless, as he wished,

the quiet, unostentatious manner peculiar to the religious society which he had been educated.

Thus passed from active life one of the best examples of the truly members of the dental profession, and we who knew his many sterling qualities, his unswerving honesty, and the constant exhibition of the highest manhood, must ever mourn his loss.

For several years his health has been such as to force him to abandon all practice, but the true exponent of a higher professional life and spirit can never be forgotten, and such a one was Daniel Keall.

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## Notes and Comments.<sup>1</sup>

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**PULP-CAPPING.**—Dr. Charles Harker has no confidence in pulp-capping when the exposure results from caries, but, on the contrary, says pulps will frequently die when capped under the most favorable circumstances; and he is further of the opinion that "a tooth-pulp, instead of being easily manageable, is so treacherous that we can never predict with certainty the result of capping."

The writer cannot entirely agree with Dr. Harker in what he says upon this subject. While it is true that we can seldom predict with certainty the result of capping, yet so large a percentage of cases in an extensive clinical experience have given such satisfactory results that we always consider it the best practice in favorable cases to cap the pulp, and at least give it an opportunity to live.

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**MIXING AMALGAM.**—Dr. Mayer, in his paper before the New York Odontological Society, upon "The Working Qualities of Amalgams," says he does not believe in working the amalgam as dry as some advocate. He wants it plastic enough to pack well, and likes to have it packed before crystallization has far advanced.

This has always been our practice. We never advocate the system of using pliers to force out the mercury so as to leave it in

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<sup>1</sup> The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

a dry and almost unmanageable condition. By working it in moderately plastic state, all surplus mercury will be forced to the surface in packing the filling, which can be removed from time to time with a small pledget of cotton.

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**DENTAL SERVICE TO THE INSANE.**—A timely editorial appears in a recent issue of the *Southern Dental Journal* upon the appointment of dental surgeons in State lunatic asylums. This matter should not be allowed to stop here. When we consider the intimate relationship and sympathy existing between the teeth and the nervous system, it seems strange that some action has not long ago been taken for the relief of this unfortunate portion of our people.

Professor Wilbur F. Litch, in writing upon the subject, says: "I have repeatedly operated for private patients in the insane department of the Pennsylvania Hospital, and there can be no question as to the necessity for the services of a skilful dentist in all such institutions. Mental diseases cannot fail to be aggravated by pathological conditions of the teeth, and the trained dentist alone is qualified to diagnosticate and treat such ailments."

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**THE TREATMENT OF "QUACKS."**—We append the following resolution as a suggestion to our professional schools. If some such action and public announcement of the same should be taken by the Faculties of dental colleges where one whom they had honored with a diploma brings discredit upon the profession and their Alma Mater, it would in our opinion have a wholesome effect upon the profession and the public.

The following preamble and resolution were adopted by the Faculty of the medical department of the University of Tennessee at Nashville Medical College, at a meeting held at the office of Dr. Duncan and Paul F. Eve, September 2, 1893:

**WHEREAS**, It appears that one E. F. Rose, of Dukedom, Tennessee, having complied with the requirements for graduation, received the degree of M.D. from the Medical Department, University of Tennessee, Nashville Medical College, in 1892; and

**WHEREAS**, It has been made known and positively proved to the satisfaction of this Faculty that the said Dr. Rose has so far forgotten and ignored the principles of honorable medicine as to enter into all manner of advertising schemes to obtain practice, in violation of the code and professional decency, etc.; therefore be it

*Resolved*, That we, the Faculty of the Medical Department, University of



Tennessee, Nashville Medical College, censure and condemn the conduct of the said E. F. Rose as unprofessional and injurious to the college from which he graduated to practise medicine, and that the dean be instructed to strike his name from the records as an alumnus, and declare him beyond the role of professional recognition.

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"To do more and be more, or to do less and be less, is compulsory; forward movement or retrogression is inevitable. All things retrograde which do not advance, is an axiom which applies alike to the college, the periodical, the society, and to the individual."

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**PROFESSIONAL FEES.**—To serve our clients best we must show a personal interest in each individual case, and remember that we are laboring not for the fee alone, but for the love and advancement of our profession. Remember the well-chosen words of Edward Everett Hale, where he says, "Professional men must serve the world not, like the handcraftsman, for a price accurately representing the work done, but as those who deal with infinite values and confer benefits as freely and nobly as nature."

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**THE SUCCESSFUL DENTIST.**—"The nimbleness and dexterity of a skilful dentist is wonderful. The very instruments and gold he uses seem alive. As he stands behind them they obey his will so promptly and with such precision they seem a part of himself. Young man, would you attain such an enviable position? Work for it with brain and muscle; sacrifice for it every foolish habit, every nonsensical indulgence, every hindering pleasure; give your life for it; bury yourself in its necessities till you can come forth transformed by the regenerating power of study and delicate manipulation."—*Items of Interest.*

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**SOME OF THE NECESSITIES FOR A CREDITABLE LITERATURE.**—The *INTERNATIONAL DENTAL JOURNAL* is not published to advance the business interests of the publishers nor the professional success of its editors. They are all free from any such collateral necessity. But some one must do the work; some one must make sacrifices if we are to have a journal freely our own. Every one who is interested in the advance and elevation of dentistry should show a personal and professional interest in the welfare of its representative.

The best way to sustain a creditable literature is for every telligent dentist to contribute what he can. Every practitioner worthy the name may have some thought or experience stored that would be helpful to others. There are a few gifted men who contribute volumes to our literature, but there are hundreds of who could enrich it with a page or a paragraph. This department is always open for such contributions. All are welcome, but this is one suggestion that we would offer: that is, in recording your observations let it always be with accuracy and truthfulness. Do not set down your own theories and speculations as absolute facts and take for granted things that are undemonstrable.

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## Current News.

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### RECENT PATENTS.

A LIST of recent patents reported specially for the INTERNATIONAL DENTAL JOURNAL.

508,564.—Dental Chair. Theodore N. Clark, Toronto, Canada, assignor to Frank E. Case, Canton, Ohio. Filed September 29, 1893.

508,677.—Dental Impression-Tray. Henry A. Burlingame, Patuxet, R. I. Filed August 11, 1893.

508,692.—Rheostat for controlling Electrically-Operated Dental Apparatus. Jonathan P. B. Fiske, Lynn, assignor to the General Electric Company, Boston, Mass. Filed July 10, 1893.

509,176.—Dental Heater. Theodore C. Lewis, Buffalo, N. Y., assignor to the Buffalo Dental Manufacturing Company, same place. Filed August 14, 1893.

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### WOMAN'S DENTAL ASSOCIATION OF THE UNITED STATES.

THE regular monthly meeting of the Woman's Dental Association was held November 4, 1893, at 1602 Arch Street, Philadelphia. President Mary H. Stilwell in the chair.

Dr. Mattie T. Haley read a paper entitled "How may we be Successful with Children?"

The next meeting will be held at 1300 Arch Street, December 2, 1893, at 7.30 P.M.

The regular monthly meeting of the Womans' Dental Association was held December 2, 1893, at 1300 Arch Street, Philadelphia, the President, Dr. Mary H. Stilwell, in the chair.

Dr. Edward C. Kirk read a paper entitled "Gum-Lancing in Difficult Primary Dentition."

The next meeting will be held at 1308 Walnut Street, Philadelphia, January 13, 1894, at 7.30 P.M.

The regular monthly meeting of the Woman's Dental Association was held January 13, 1894, at 1308 Walnut Street, Philadelphia, Dr. Elizabeth A. Davis, Chairman of Executive Committee, in the chair.

Dr. Martha C. Corkhill read a paper; subject, "Advisability of Explaining Existing Conditions to Patients."

The next meeting will be held at 1308 Walnut Street, Philadelphia, February 3, 1894.

ELIZA YERKES,  
*Recording Secretary.*

4004 CHESTNUT STREET, PHILADELPHIA.

## DENTAL COMMISSIONERS OF CONNECTICUT.

THE following are the commissioners under the new law passed in that State: Dr. Civilion Fones, President; Dr. George L. Parmele, Recorder; Dr. William J. Rider, Dr. Charles P. Graham, Dr. Richard W. Browne.

## ST. LOUIS DENTAL SOCIETY.

THE following officers for the year 1894 were elected January 2, 1894:

President, Dr. J. B. Newby; Vice-President, Dr. J. B. Vernon; Recording Secretary, Dr. F. F. Fletcher; Corresponding Secretary, Dr. John G. Harper; Treasurer, Dr. A. J. Prossor.

*Committee on Ethics.*—Dr. William N. Morrison, Dr. P. F. Hel-muth, Dr. O. H. Manhard.

*Committee on Publication.*—Dr. L. A. Young, Dr. P. H. Eisloeffel, Dr. C. L. Pepperling.

JOHN G. HARPER,  
*Corresponding Secretary.*

## Selections.

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### FORMALINE: AN IDEAL HARMLESS GERMICIDE.

FORMALDEHYDE ( $\text{HCOH}$ ) as known is a gas under normal conditions of temperature and pressure; it is readily soluble in water and such a solution of forty-per-cent. strength is put forward under the name of "formalin." This liquid mixes in all proportions with water, and any required dilution can be readily prepared; thus, for instance, by mixing 1 part of formalin with 40 parts of water, 40 parts of a one-per-cent. solution are at once obtained.

Even at ordinary temperatures, formalin gives off gaseous formaldehyde and the evolution of gas is of course accelerated by application of heat.

Exhaustive and numerous experiments on the bactericidal power of formalin were carried out by Dr. J. Stahl. Berlioz and Frilla, already mentioned, had found that anthrax bacilli were killed by dilution of 1 : 50,000, while Aronson stated that solutions of 1 : 20,000 prevented the development of typhus and anthrax bacilli as well as of *staphylococcus pyogenes aureus*. Stahl's observations proved that after one hour's exposure to a one-per-mille, or a quarter of an hour's exposure to a one and-one-third-per-mille solution of formalin, the most resistant forms of micro-organism were destroyed. At the least, therefore, formalin is equal in germicidal power to sublimate and under certain conditions would be superior where albuminoid solutions are concerned.

As already intimated, great importance is attached to the applicability of the ideal antiseptic in gaseous or vaporous form, as only in this way can we conveniently disinfect large rooms and more delicate articles in closed apparatus. The experiments carried out by Dr. Stahl with formalin vapor were made in a large glass bell in which was set a small table carrying potatoes freshly inoculated with pure cultures of typhus, anthrax, cholera, etc. The glass bell stood upon an iron plate which exactly closed it. The experiments showed that 2.5 volume per cent. of formalin in the air destroyed all micro-organisms in a quarter of an hour. Undoubtedly even better results would have been obtained could a constant stream of formalin vapor have been conducted over the cultures.

Summing up the results of experiments, the properties of formalin may be expressed as follows :

1. It has an extraordinarily active microbicide power similar to that of sublimate.
2. It is comparatively non-poisonous.
3. It attacks only the substance of the contagious material, leaving intact the articles treated, whether of organic or inorganic nature.
4. It is very readily employed under all circumstances either as a liquid or in gaseous form.

It is a marked advantage of the vapor of formalin that its specific gravity closely approximates to that of the air, so that there is no difficulty in keeping the atmosphere of an enclosed space uniformly impregnated with formalin vapor.

Dr. Stahl recapitulates the methods of using formalin by spray and vaporization, pointing out that, for the superficial disinfection of furniture, articles of clothing, etc., spraying with a one-half-per-cent. solution should be resorted to and carried out with as much energy as possible. In gaseous form the preparation promises to do good service in the dry disinfection of more delicate articles in closed vessels as well as of furs, dressing material, and the like.—

*Notes on New Remedies.*

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## RESECTION OF THE INFERIOR MAXILLA WITH IMMEDIATE PROSTHESIS OF AN ARTIFICIAL JAW.

*Dr. P. Michaux.*—I wish to communicate to the Society the remarkable results obtained by me in a case of immediate prosthesis after complete excision of the right half of the inferior maxilla, by the method recommended by Dr. Claude Martin (Lyons).

The case is briefly as follows : epithelioma of the lower lip of four or five years' duration ; patient aged thirty-six ; removal by free excision on June 27. Recurrence on September 15, and rapid invasion by the disease of the body of the lower jaw on the right side. On November 2, the right half of the inferior maxilla was excised, and an artificial jaw inserted at one and the same operation. The artificial maxilla employed was made of vulcanized india-rubber with a number of perforations according to Dr. Martin's suggestions (a central tube with a buccal orifice, and communicating with a whole series of channels which open all along the free edge of the body

and ramus of the artificial jaw, so as to permit of the free irrigation of the region). It was screwed by means of two metal plates to the internal surface of the remaining half of the inferior maxilla, while it was also connected by a spring with another apparatus fixed to the under surface of the superior maxilla.

When the patient recovered consciousness the action of the apparatus proved very satisfactory. The external wound was dressed with iodoform, while the interior of the mouth was constantly irrigated through the perforations in the artificial jaw. This method of irrigation is perfect; the patient's temperature never rose above the normal. At the end of seven days the parts had completely healed, and the sutures were removed. This is the twelfth day after the operation and the inferior maxilla already possesses an extensive range of movements. The patient takes soup without slightest difficulty, and he speaks tolerably well. In short, the results of the operation are most satisfactory, especially in presence of the unsightly deformity which is produced by resection of the lower jaw by the ordinary methods, such as want of correspondence of the teeth, deviation of the remaining half of the maxilla, difficulty of speech, mastication, etc. There was a total absence of the grave septicæmic and infectious complications which are frequent after this operation, a result which is probably due to the method of irrigation through the perforations in the artificial jaw.

I consider, therefore, that the prosthetic apparatus devised by Dr. Martin is a distinct advance in the surgery of the jaw. It gives better results than those obtainable with a secondary operation (always a difficult procedure) or the simpler appliances employed in Germany by Bœnecken.

*Dr. Prengrueber.*—About three months ago I performed an operation similar in every respect to that just described by Dr. Michelson on the indications furnished by Dr. Cl. Martin. It was a case of cancer of the floor of the mouth involving the inferior maxilla and the anterior half of the tongue. A portion of the body of the tongue on either side of the symphysis and the anterior half of the tongue having been excised, the immediate insertion of an apparatus proved especially useful in enabling the tongue to be at once fixed to the apparatus. The operation gave excellent results, but, unfortunately, the disease recurred at the end of a month.—*The Med. Weekly*, Paris.



# THE International Dental Journal.

VOL. XV.

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No. 3.

## Original Communications.<sup>1</sup>

THE SCALLOP WIRE PLATE FOR RETAINING TEETH  
IN PLACE AFTER WIDENING THE DENTAL ARCH,  
AND FOR CORRECTING SLIGHT IRREGULARITIES  
WHEN NECESSARY.

BY J. N. FARRAR, M.D., D.D.S., NEW YORK CITY.

To devise regulating mechanisms that will cause force, approximating in accuracy that derived from the screw, without using the screw, and to devise retaining mechanisms that will do no harm to the teeth, has been one of my aims, until I now have a considerable number perfected. In some of these the plate constitutes a part, and in others it does not. In this paper I shall confine myself to the former, leaving some of the other class for future presentation.

After widening or enlarging a dental arch, the teeth should be retained in place artificially for about a year, sometimes longer. For this purpose, roof-plates for the upper jaw and U-shape alveolar ridge-plates for the lower are generally used. If these plates are put in the mouths of careless patients who do not keep their teeth clean there is danger of causing injury to the teeth where the margin of the plate rests against the enamel. Of all retaining-plate mechanisms that I ever devised or ever have seen for such

<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

cases, I think the scallop wire plate is the best, because it fills the office for which it is intended and permits no food *débris* to remain sufficiently long to do injury.

In Fig. 1, which represents one of these mechanisms for the upper arch, W indicates the scallop wire and R the hard rubber plate. This plate fits the roof of the mouth, but does *not* extend so far forward as to be in contact with the teeth. *There is a space about one-eighth of an inch between the plate and the scallop wire.* This wire, which is bent in zigzag form to fit the lingual surfaces of the teeth, is anchored to the plate by three wire arms, P, P, P, one end of each of which is soldered to the scallop wire, the other embedded in the substance of the plate at the time it is vulcanized.

For the upper jaw there are two ways of holding the mechanism on the teeth; one by an air-chamber, the other by Tomes's clasp, which is a modification of the Schange crib (1848). In rare instances, however, both are useful. The Tomes clasp does not encircle the teeth, but extends over them, so to speak, the wire resting along the *apical valley* on the grinding-surfaces, thence curving towards the teeth on the buccal side, where it grips one or two teeth near their necks. The scallop wire, the clasps, and the arms are made of round wire about the size of a small knitting-needle, each clasp being in contact with one of the posts.

It may be thought that the clasps will move inward the teeth borne upon; this, however, would be erroneous, because the clasp and the scallop wire on the opposite side of the tooth holds it firmly as if in a vise.

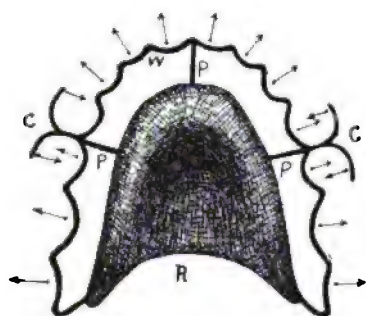
Fig. 2 represents a scallop wire retaining and regulating plate having two clasps on the sides and a double hook in front. The latter was for holding the central incisors in place after having been turned during the time the arch was being enlarged.

This plate has advantages other than that of safety. One of the best of these is, that it can be made to correct irregularities when one or more of the teeth have not been moved sufficiently far, or when teeth have lost ground and again become irregular. Such can be pushed into line by repeatedly bending outward the part of the wire in contact with the tooth or teeth to be moved, so that it will press against them. The office of this plate, when first made, was to retain all the teeth in place except the cuspids, which were required to be moved still farther outward, and which were corrected by the mechanism.

*Smaller Scallop Wire Plates.*—Smaller plate mechanisms, made on the same principle for holding a less number of teeth (even a

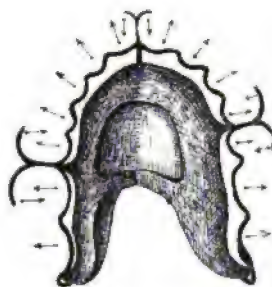


FIG. 1.



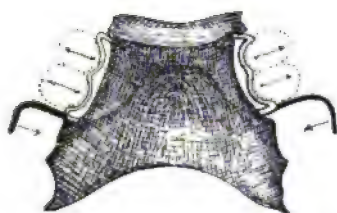
Upper scallop wire retaining plate. (Farrar.)

FIG. 2.



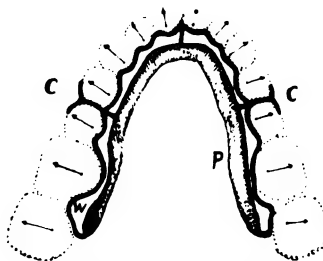
Upper scallop wire retaining and regulating plate. (Farrar.)

FIG. 3.



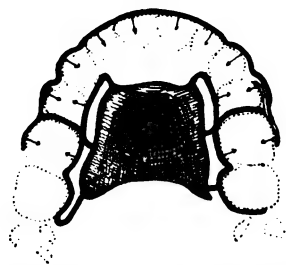
Scallop wire plate for regulating the upper bicusps and then retaining them in line. (Farrar.)

FIG. 4.



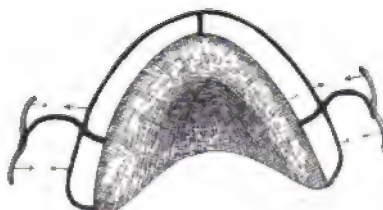
Lower scallop wire retaining plate. (Farrar.)

FIG. 5.



Outside scallop wire retaining plate. (Farrar.)

FIG. 6.



Plain wire retaining plate. (Farrar.)

*Plain Wire Retaining Plate.*—I sometimes make plates on the plan of Fig. 1, except the scalloping of the wire, the latter being left straight or plain all the way around the arch. While the mechanism will retain a widened or enlarged arch in proper form it will not prevent sidewise movements of the teeth, if they are disposed to so move; nor does the plain wire permit of alteration of form in one place without causing a change of form elsewhere; it is therefore comparatively useless for regulating teeth. (See Fig. 6.)

## THE CARE OF THE TEETH TO THE FIFTEENTH YEAR.<sup>1</sup>

BY SAFFORD G. PERRY, D.D.S., NEW YORK CITY.

A LENGTHY monograph could be written on the care of the teeth up to the fifteenth year. I shall only attempt to consider briefly some of the most important points.

Commencing between the third and fourth years, I will go over the teeth somewhat in the order of their eruption.

In the successful management of little children there is a condition that precedes wisdom and antedates experience, and that condition exists in the heart rather than the head of the operator.

The rude instrument is tempered with gentleness and made a means of mercy in the hands of one who has a deep love for little children, and an operator who has little ones of his own, and whose heart in consequence is kept warm and sympathetic, will be more likely, all other conditions being equal, to be successful in saving the temporary teeth.

In caring for the temporary teeth, the heart should be full of love; in managing the permanent ones, the head should be full of wisdom. In other words, a cold, scientific method cannot be strictly applied to the care of the temporary teeth. The selection of filling-materials and the manner of using them may not be of much importance in teeth that are to last at the most eight or nine years, but in those that are to last a lifetime, the materials selected and the manner of using them may tax to the utmost the ripest powers of the best minds in our profession. It is doubtless true that many operators look with indifference upon the temporary teeth. This

<sup>1</sup> Read before the Odontological Society of Pennsylvania, January 13, 1894.

probably arises from the fact that these teeth, as the name implies, are temporary, and seem of less value, and while to work upon them is not exactly a waste of time, yet it is somewhat like writing on the sand,—a short time elapses and all trace is gone!

One can forgive a grown man for sometimes feeling impatient at having to spend his time excavating and filling little cavities in a baby's teeth, when he might be engaged in more responsible and important professional work; or when, with his experience of the world, and his knowledge of business principles, he might be at the head of some great business enterprise.

There are operators who take but little interest in children, and consider that until their permanent teeth need attention they are suitable patients for the assistant. They are annoyed by the timidity, the restlessness, the inquisitiveness of childhood, and persuade themselves that they are wise in reserving themselves for the permanent teeth. There are still other operators, and many patients who, considering the cost, and the pain to the little ones, mutually agree to reserve the labor and expense for the permanent set.

In a first-class city practice the question of expense is not, perhaps, a very important factor, but outside of the large cities it is important, and necessarily and justly must be considered in deciding upon the treatment of the temporary teeth.

In beginning with a family of children, it is well to have the little ones brought for an examination before there is much chance of work being required, so that they may go away with pleasant recollections of the operating-room. In fact, the whole training of a child with the temporary teeth should be preliminary to, and should lead up to, the proper care of the permanent teeth when they shall be erupted. A child well trained with the temporary teeth, which are not, as a rule, very sensitive, will be unconsciously well prepared to bear the harder work which will be needed in the permanent ones.

In operating for children, the first necessary condition is to get their confidence. When that is secured, the battle is more than half won. This will not be accomplished if the operator insists in all instances on doing thorough work. To excavate all cavities thoroughly, and to fill them accurately, may cause so much pain and may produce such an effect on the nervous system of the little patient, that the object sought—the salvation of the teeth—may be entirely defeated. The child, not yet old enough to be reasoned with and to exercise self-control, rebels, or, if of a patient nature and desirous of being submissive and obedient, gets into an hysteri-

cal state and makes a scene, and with the work unfinished is taken away by the parents, who declare that the teeth shall be lost rather than have their darling made so unhappy.

Instead of insisting, with the manner of a school-master, on thorough excavation, it is better to prepare the margins of the cavities with a light touch and a sharp instrument, cutting always slowly instead of rapidly and nervously, and, when necessary, leaving much of the softened and decayed tooth in the bottom of the cavity. If the margins are well prepared, and creosote or nitrate of silver is applied to this softened dentine, and the cavity is filled with oxyphosphate, decay does not progress to any great extent under the filling. At the end of six months or a year, when the filling is considerably worn down, it can be all taken out, and the cavity can then, in most cases, be painlessly excavated and refilled in such a manner and with such materials as to last, perhaps as long as the tooth will be needed.

In excavating cavities for little children, I go as far as I can without producing a state of great excitement, but rather than to abandon the teeth I fill them in this imperfectly excavated condition, and generally with the results above described.

Sometimes, however, if a child from three to five years of age is brought to me with the conditions of the mouth so destructive, and the teeth so badly decayed that they cannot be saved with an immense amount of work, and by keeping at work upon them until the permanent teeth come in, making a martyr of the little tot, I deliberately advise the parents to let them go unfilled. I do this with the understanding that not only the teeth, but the roots also, shall not be extracted. I had rather have the child's mouth filled with decayed teeth and roots, accompanied, as they sometimes are, with disturbed gums and unpleasant breath, than have them taken out, and let the first permanent molars slip forward into their places.

Some of the most perplexing cases of irregularity I have ever seen have been produced in this way. I will not say that the temporary teeth in front of the temporary molars may not sometimes be extracted, but I emphatically declare that the second temporary molars should not be taken out until the first permanent molars are in place and the second bicuspid ready to come in. I have no fear that even the diseased roots of the temporary teeth, if left in, will do harm to the second set. I have never seen such harm.

It may seem like shirking one's duty to abandon a set of badly decayed temporary teeth; but nature is not altogether unkind, and



cap is so gradual and so unaccompanied by extreme sensitiveness in the temporary teeth, exposure of the pulps even being so often painless, or if painful so amenable to simple treatment, that I have little hesitation in advising the deliberate abandonment of teeth that are so badly decayed that the child must be made a martyr of if the attempt be made to save them.

A child with unfilled temporary teeth can be dismissed to the beach or the mountains with very little danger of having pain which cannot be controlled by some simple remedy which any mother would know how to apply. But let a child with the temporary teeth all filled go beyond the reach of the dentist, and have the pulp die or a dead tooth ulcerate, and see how pitiable and helpless the case is. It makes the heart ache to think of the helplessness of a little sufferer under such conditions, and it should make one pause to ask if dentistry, after all, is an unalloyed blessing, practised as it is by so many who are without heart or judgment.

In making examinations, and in operating on the temporary teeth, one most important fact should be kept in mind,—namely, that, if possible, no cavity should be allowed to become so large as to expose a pulp.

This should be looked after in order to avoid the danger of future abscesses, as well as to insure the natural absorption of the roots on the approach of the permanent teeth. Of course it is well known that the roots of dead teeth are not absorbed, as is the case with the living ones.

If a pulp which has not been aching becomes exposed in excavating, I promptly cap it in the manner so long since described by Dr. Jack,—filling a little saucer-shaped cap of platinum with a paste made with the oxide of zinc and carbolic acid and oil of cloves, in equal parts, placing this over the exposed point, and then filling the cavity with oxyphosphate. The metal cap prevents pressure, and the paste sterilizes the exposed point and allows healing by first intention. These little caps, as you know, are made by rotating a round-faced burnisher with pressure on a piece of thin platinum, which rests against a piece of soft wood. They are then cut out with a pair of curved scissors, and kept on hand of different sizes, ready for use.

If the pulps have been long exposed and aching, then I destroy them in the usual way; but after their removal I do not undertake to fill the roots to their extremities with any solid filling-material. It is quite likely that in this respect my practice is not like that of most operators. In the first place, I do not believe in filling roots

unless it can be done so perfectly as to stop all germ action; and in the second place, I do not like to put in a filling that cannot easily be taken out. I take out the pulp and its canal extensions as well as I can, and then fill the canals, and sometimes even the pulp-chamber, with cotton saturated with iodoform. Occasionally I use oxychloride of zinc instead, but I do not mix it so as to make a filling, but only use a little of it entangled in the cotton so as to increase its antiseptic effect.

In case of trouble, after the filling is removed from the cavity of decay, this cotton is easily pulled out of the roots, and recovery usually ensues promptly. In impending trouble I have very many times passed a small bur under the gum on the buccal side of the pulp-chamber, but this is not very satisfactory if the cotton is closely packed, as vent is not secured.

In some unpromising cases I have put a piece of metal over the opening into the pulp-chamber, filled the cavity of decay, and then promptly drilled a small vent-hole from under the gum into the empty pulp-chamber.

Sometimes I have proceeded in this way, but have omitted drilling the hole, leaving that operation to be done only when needed. But in all cases where the hole is not drilled, I put into the pulp-chamber a few fluffy shreds of cotton carrying iodoform. The cotton is only used to convey the iodoform, and is so loose that when the tooth is ever drilled it does not prevent a prompt ventilation of the pulp-chamber.

In selecting a material for filling the ordinary cavities in temporary teeth, there are several conditions that should be regarded. For instance, in cavities on the grinding-surfaces of molars, for children who will not allow thorough excavation, almost invariably use oxyphosphate. If the edges are fairly well prepared, this makes a filling which will usually arrest or delay destructive action, even though considerable decayed dentine is left in the bottom of the cavity.

On the approximal surfaces I generally prefer gutta-percha in these partially prepared cavities, as it does not wash out near the gum. Sometimes, as with the permanent teeth, I use gutta-percha near the gum and oxyphosphate near the grinding-surface.

On the grinding-surfaces of the temporary teeth, if the cavities are large, the teeth of good quality, and the little patient will allow thorough excavation, I usually fill with amalgam, wiping away the surplus mercury from the surface of the filling with a little mass of well-annealed crystal gold.

If the cavity is small, so that not much surface is exposed to attrition, I fill with tin-foil. Under certain conditions I consider this is the most beautiful material ever used for filling teeth. It is a constant wonder to me that the profession does not seem to appreciate its value. In searching for other materials its importance seems to have been overlooked.

Of course, I fill a great many of these large and small cavities with oxyphosphate, expecting to renew it when it has worn down.

On the approximal surfaces I am as careful about the restoration of contour as with the permanent teeth, for I consider it important that the little patient should be able to eat without the annoyance of the crowding of food against the gum. Occasionally I pack a single piece of gutta-percha into two adjoining approximal cavities, binding the two teeth together. The elasticity of the gutta-percha allows this, which would not be the case with the oxyphosphate or with amalgam. Either of the latter substances would break out from one cavity or the other, owing to the constant movement of the two teeth and the rigidity of the materials.

I quite often apply the rubber-dam to the temporary teeth, and when approximal cavities are to be filled, I find it of great value, not alone in keeping the cavities dry, but by allowing the use of different obtundents which can thus be kept off the gums. It also allows the neat use of nitrate of silver before filling. This I consider a preservative, as so well pointed out by Dr. Stebbins in the *INTERNATIONAL DENTAL JOURNAL* for October, 1891, though I use it somewhat differently from the manner described by him.

Long after I abandoned the Arthur system as applied to the permanent teeth, I continued its use with the temporary ones, but never except in cases where a firm point of contact could be left to hold the teeth in position and protect the gum. For many years I have abandoned all such cutting, except on the approximal surfaces of the temporary incisors, where I sometimes apply Dr. Arthur's system.

On all approximal surfaces of temporary molars I cut down, even for small cavities, from the grinding-surfaces, leaving as much as possible of the side walls standing, and then fill up flush, so that the perfect shape shall be preserved. I do not often cut in from the buccal or lingual sides, because the temporary teeth are, as a rule, very short. I take great care that no space is left into which food may crowd and be forced against the gum. Formerly, in cases presenting previous to the eruption of the first permanent molars, I often ground away the posterior surfaces of the temporary molars,



leaving an abrupt shoulder at the gum, which was to hold the permanent molar in place, but leaving its front surface free. Sometimes worked well, but not always by any means, for sometimes the first permanent molars would tip over against the surfaces and cause their decay, besides moving towards the front of the mouth and crowding out the bicuspid, which were to come.

After all these years of beating around the bush in the hope of finding some easier way to escape the dangers that beset the method, I have settled down to the belief that in developing a denture in a growing child the safest way is to follow the plan laid down by Mother Nature when she works at her best. In doing this, I have two distinct objects in view,—namely, the preservation of the natural position of the teeth, so that comfortable use of them is assured, and the keeping of even the roots of the temporary teeth in position, so that the first permanent molars shall be held back in their proper places until the bicuspid are ready to come in. When all resistance or obstruction is removed, there is a marked tendency of the permanent molars to drift towards the front of the mouth, a fact which may be overlooked, particularly by young operators.

Dr. Dwinelle once told me that he had seen a first permanent molar which had drifted forward until it stood tightly against the bicuspid. At the time the first permanent molars are coming in there is no obstruction in front, they drift forward with surprising rapidity.

In filling the approximal surfaces of the temporary molars, where the grinding-surface enamel has had to be cut away, leaving large openings into the cavities, I get a quick and excellent result by the use of hand matrices, which enable one to keep the shapes of the teeth, and which save the trouble of finishing off the fillings at the gum and on the entire approximal surfaces. I exhibited these matrices before the New York Odontological Society last April. They are kept in place by a handle which is held in the left hand, and they are of great value when operations have to be made quickly for restless patients. They are of equal value applied to the permanent teeth.

In preparing these cavities on the approximal surfaces for gutta-percha, it is well to avoid as far as possible cutting away much of the plate of enamel on the grinding-surface ends of the teeth. This is of great value in protecting the fillings from rapidly wearing away. If gutta-percha is used in small pieces, and packed so that what as gold is, it can be inserted through rather small openings.



that much loss of this enamel is not necessary. In such cases, of course, no matrix can be used.

Before leaving the consideration of the temporary teeth, lest I may be misunderstood, I want to repeat that I advocate the imperfect preparation of cavities only in cases where the teeth are very sensitive and the little patient is nervous and unmanageable, and when, if that humane plan were not followed, the task would be too great for both patient and operator. These imperfectly prepared cavities are greatly benefited by the nitrate-of-silver treatment.

We come now to the consideration of the permanent teeth. Naturally, according to the order of their development, we shall be concerned first with the lower first permanent molars.

With all families regularly under my care, I aim to have each child well in hand and in good training by the time these teeth appear. Without waiting for the teeth to get well through, I make careful examination of all the fissures in the crowns. To do this, I often lift the flap of gum which commonly lies over the posterior portion of the grinding-surface with a peculiar instrument made for the purpose. If I find a soft place, even if it is not a pronounced cavity, I clear it out with a round-pointed instrument which is like a probe or examining instrument, and fill with oxyphosphate or tin-sil. I make very little attempt to cut out or prepare these little fissures, because at that time they are imperfectly calcified, and the tissue is so soft that quite a cavity could be easily made. A round-pointed instrument is all that is required for scraping out these fissures if they are to be filled with oxyphosphate.

A year later, when the tooth has grown out of the gum, and the filling nearly washed out, the border of the fissure will be so well calcified that a real filling may not be required. These teeth at this time do not antagonize with the upper molars, even if they are erupted, which they generally are not; so that the entire crown can be covered by the filling, and all its fissures protected, whether they show signs of softening or not.

For many years it has been my habit with soft teeth to wash out these fissures and put a pat of oxyphosphate in them, even if they are not softened at all. If they are dried out, the filling will usually stay, even if no cutting has to be done. This serves as a protection while the gums lie over the ends of the teeth, and while they are still unused in mastication. When the tooth gets well through, and is antagonized and used, the danger of softening of the fissure is greatly lessened. When the upper molars are through they are treated in the same way.

Later, after the lower molars are well developed, the little fissures on the buccal sides are to be carefully watched. If these are deep enough to catch the instrument, cavities must be made which will always have to be kept filled. There is no chance on this surface for the same kind of protection that can be given on the grinding-surface, pending the calcifying process. Here it must be a cavity for all time, or not at all. These little buccal cavities can often be filled in a few moments with tin-foil, in such a manner as to last many years. I almost never make any attempt at this time to fill them with gold, for the reason that I think I can fill them better with tin. If the child has not been brought soon enough, and cavities on the grinding-surfaces are of considerable size, I fill them almost invariably with tin or oxyphosphate. Sometimes, and for reasons which cannot be easily made plain here, I fill them with gutta-percha, but not very often with amalgam, and certainly not very often at this age with gold.

Although not quite in the order of time, it may be well here to dispose of the anterior approximal surfaces of these teeth. While the last temporary molars are in place these surfaces must be watched most carefully, and the slightest sign of decay must be regarded. I fill on these surfaces almost invariably with gutta-percha, as on all sheltered approximal surfaces. I believe this material will last longer than any other of the plastics. But when the baby molars are lost, and the anterior surfaces of the sixth-year molars are exposed, I almost invariably fill with gold, and in the most careful manner, and always strictly with regard to the natural shapes of the teeth, being careful to bulge the fillings out to a full contour, so that when the second bicuspid grows up they will rest against the fillings and as little as possible against the teeth. This operation is often difficult to perform. It is the first serious one the child has been asked to submit to, but there is no escape from it, for never again will the surfaces of these teeth be so favorably exposed and the opportunity given for the performance of so perfect an operation. If left until the second bicuspid is in place, then, of course, the teeth must be separated, and it will not be possible to reach the entire surface in so satisfactory a manner.

For this operation the rubber-dam is of course applied, and after the actual decay is removed, the whitened, partially decalcified margins of the cavity are bevelled so as to allow of extending the gold filling out on all sides beyond the real margin of the cavity. If the entire front surfaces of these teeth can be covered with gold,

of course they will be safer when the bicuspid are in place against them.

The performance of this operation may mark the first real encounter with the young patient. If there has been gentleness and leniency before, there must be firmness and thoroughness here. But of course the patient is old enough by this time to bear such an operation, and to understand its significance and importance, and it is not often that one cannot, with the use of such obtundents as we now have, perform this operation in a perfectly permanent manner.

It seems to me that whatever may be said in favor of plastics before the fifteenth year does not apply with equal force to these approximal surfaces. In the first place, as before mentioned, they can never again be so well reached; and in the second place, they have been standing during several very dangerous years in contact with the baby molars, and if not actually decayed, their surfaces are likely to be more or less softened and in a condition favorable to decay soon after the bicuspid are in place. Gold is the only material that can be carried out to a thin edge over these bevelled margins with any certainty of its staying where it is placed. I instruct all parents to promptly bring their children when the posterior baby molars are lost. If they are careless about usual examinations, I beg them to be careful about this.

On the buccal surfaces of the first permanent upper molars, cavities sometimes occur which extend around partly on the posterior approximal surfaces. These cavities I usually fill with tin or gold before the appearance of the second permanent molar, and also for the reason that the posterior surface can never be so easily reached after the latter molar is in place. The posterior aspect of these buccal surfaces is very apt to be decayed before the second permanent molars are in place. The careful polishing of these surfaces, if promptly done, coupled with special directions for careful brushing, will often save them from decay.

"You must brush your teeth more," is advice that, given in the usual way, generally goes in one ear and out of the other, with the average patient of this age. But often a few earnest, impressive words, expressed with tact, will work wonders with some patients. The young mind is impressionable, and doubtless we do not always realize the effect a few earnest words may have. But they must not be expressed with the manner of a school-master. If the young patient is complimented with the assumption of possessing intelligence, and that intelligence is appealed to in a persuasive, con-

vincing way, the seed may be sown in productive soil that will bring forth more than a hundred-fold. And this education of our young patients to an appreciation of the value of proper care of the teeth is as much our duty as to fill their teeth properly. I am sure most of us are too negligent on this point.

We must now go back several years to take up the superior permanent incisors. When these teeth are decayed on the approximal surfaces, one is brought face to face with a serious problem. The question is, To what extent shall gutta-percha, oxyphosphate, or tin-foil be used? I must say to you frankly that in most cases I use one or the other of them in preference to gold. Of course, I shall expect to be criticised by many for this, but I must be governed by the results of my own observation, and I have seen so many cases where gold fillings have so quickly failed, particularly when made soon after the teeth are erupted, that I have grown very shy about the use of gold at this time. At this age the teeth are so soft that even little cavities have to be enlarged to get the firm margins required for gold fillings, and when failure comes there must follow a still greater enlargement, so that by the time the child has arrived at twelve to fifteen years of age, by which time several renewals may have been required, large cavities exist.

If, instead, the teeth, when softened and slightly decayed, are opened with a separator, polished with a fine sand-paper strip, the little cavities cut out, *not too thoroughly*, and filled with a good quality of gutta-percha, or sometimes with tin-foil, and several renewals of these fillings made up to the fifteenth year, the chances are that the cavities will not be as large as if gold had been used. If as large, it is safe to say they will be no larger. There is still the advantage that not so much work has been done, and not so much expense incurred. Of course, if the teeth are of first-class quality, this does not hold true to the same extent as in those that are very soft, and in mouths that are destructive. The failure of a gold filling necessarily implies increase in the size of the cavity. The failure of a gutta-percha filling does not, by any means, imply such an increase. It fails from waste of substance of filling, and not from increase of cavity, and the same is true, to some extent, with a tin-foil or an oxyphosphate filling.

I have come to have very pronounced opinions on this question of selection of materials for young, soft teeth. Having had to manage a large practice for many years, I have often been forced from lack of time to adopt this plan of treatment for temporary purposes, but I have seen such good results from it when applied

in this way that I have come to regard it, under certain conditions, as the very best practice for permanent purposes. I could show you cases where the bicuspid and molars are contoured with gold in the most elaborate manner, and yet on the approximal surfaces of the incisors only gutta-percha has been used for the last ten or fifteen years. Many renewals of the gutta-percha have, of course, been made in all this time, but there has not been an increase in the size of the cavities, and the teeth present a better appearance than they would if filled with gold. These fillings are in the mouths of most particular patients, who expect the very best treatment. The silk is used daily, the approximal surfaces are kept clean, and decay does not recur around these fillings. In making the renewals, only a few moments are required. A separator is applied, and space enough gained for passing a thin emery silk strip for finishing. After the filling is inserted, a piece of floss silk wet in chloroform is passed between the teeth, and the thing is done. Why should I fill these teeth with gold, when year after year shows no increase in the size of the cavities, and the patients greatly prefer to have them as they are? Of course, these are extreme cases, but they serve to show what can be done when great care is applied to this kind of treatment.

The next teeth in order are the second permanent molars. The fissures in these I treat in nearly the same manner as those of the first permanent molars.

The next after these are the bicuspid. The fissures in the crowns of these I also treat in nearly the same manner,—that is, I fill them with oxyphosphate or with tin-foil, mostly with the latter. In cutting out and preparing these fissures, as well as those in the molars, I am careful not to make large holes. I usually cut them out with extremely fine excavators, and aim to make the fillings as small as possible. If I use the engine for these, it is with only the minim burs, which are of course the smallest in the market. The engine is a savage instrument, and there is great danger, in its use, of cutting larger holes than are necessary. The teeth are priceless structures, and should be operated on with a feeling akin to reverence. This feeling is not much encouraged by the use of these modern dental saw-mills, which in steady hands may be safe enough, but which in unsteady or unwise ones may do an immense amount of mischief.

If the teeth are of good structure and the margins of the fissures hard, I fill them with gold once for all. With these teeth, as well as with the second permanent molars, we are dealing with a

child older and more manageable than when the first permanent molars first required attention, and there do not exist quite the same reasons for the use of plastics.

We come now to the approximal surfaces of the bicuspid and molars. As with the corresponding surfaces of the incisors, we have to meet a question not easily disposed of. To a certain extent, with cavities to the fifteenth year, I follow the same plan as the one I apply to the incisors. If the teeth are very soft and the cavities very little, I almost invariably open them with the separator, polish the approximal surfaces with the sand-paper, and cut out the decay and fill with gutta-percha or tin-foil, being careful to in no way injure or change the contour of the teeth. In doing this I cut in from the buccal or lingual side, or down from the grinding-border, though I avoid, if I can, going through the enamel on the grinding-surface.

If the tooth is of fair quality, and the cavity so large that the enamel on the grinding-end is already crushed in, I treat it somewhat as I do the anterior surfaces of the first permanent molars,—namely, fill promptly with gold in the best possible manner. Such cavities, when filled, would leave but little of the tooth standing in contact with its neighbor, and there would not be much danger of a renewal of decay.

The reason for adopting this course lies mainly in the fact that the grinding-surface being undermined and destroyed, there is no protection to the gutta-percha, and an attempt to follow this line of treatment would necessitate such frequent renewals that what might be gained in one way would be lost in another. Let me say here that I use the oxyphosphate very little on the approximal surfaces, and for several years, I may say, not at all without putting a layer of gutta-percha to the extent of about a quarter or a third of the cavity, next to the gum.

Let this point be noted carefully: Oxyphosphate is the most dangerous and treacherous filling that can be put in on an approximal surface, unless it is intended to be, and unless it is sure to be, for the most temporary purpose. In advocating this plan of practice pending the solidification of the teeth, if it involved the use of oxyphosphate alone, on large approximal cavities, I should be preaching a doctrine fraught with the gravest dangers. Oxyphosphate, rightly used, is one of the best materials we have, but, with copper amalgam, it is responsible for the loss of an innumerable number of pulps, owing to undetected and treacherous chemical solution and waste along the cervical borders.

The safeguard against the danger of copper amalgam is never to use a particle of it under any circumstances. The last use I made of it before I excluded it from the office entirely, was in the small fissures of the grinding-surfaces of the molars. It does well in these places, but it wastes away somewhat like the oxyphosphate, though not so rapidly, and it discolors the teeth. I cannot imagine a fissure that cannot be as well filled with tin-foil, even if it has to be done under water. Copper amalgam has caused me so much vain regret, and so much humiliation, that I cannot think or speak well of it for any place in the mouth. In its present state of uneven and uncertain manufacture, I think it best to exclude it entirely. The safeguard against the danger of oxyphosphate lies in the use of gutta-percha along the cervical borders. This combination makes a very good filling for the approximal surfaces in young, soft teeth, or for frail, badly-decayed teeth of any age. In these approximal cavities, which have lost the enamel on the grinding-surface border, I have often used gutta-percha alone, protecting it from rapid wear by plunging into it a warmed platinum pin from an old rubber tooth, the head of which has been beaten out flat, and given a somewhat triangular shape corresponding to the outline of the grinding-surface aspect of the cavity. This stops the wear, and many times gives a good result.

A gutta-percha filling is not treacherous. It fails by wearing away on the surface, and that very deficiency brings the patient back with the fear that a filling is out. But the operator can possess his soul in peace, knowing that there is no danger to the tooth, because the wearing away of the filling brings the patient back in ample time. Had it been a filling of oxyphosphate, the patient would have been sailing on a happy summer sea, unconscious of the rocks beneath, and when brought back to the dentist by an ominous growl it would then be found that it was too late to avert all the ills that follow the exposure of the pulp.

Before I leave this interesting subject of the development of the teeth,—for that is what it is, Nature supplying the underlying force, and the dentist giving it, as the case may be, wise or unwise direction,—let me say, that in all the operations I have described or hinted at, both on the temporary and permanent teeth, I have had one fundamental idea in mind, although perhaps not before so clearly expressed, and that idea has been the *perfect preservation of their natural shapes*. From this I allow no deviation except in the case of temporary incisors, and in a few instances upon the posterior sides of the last temporary molars, but not until the first

permanent molars are in place. Only with these few teeth do I admit that there is any advantage to be derived from the Arthur system.

Now, to sum up: This paper may seem to be a plea for plastics. So it is, to a certain extent, to the fifteenth year. But there is great opportunity here for misapprehension. Please note that I do not advocate this to the same extent when applied to teeth of good quality, in mouths which are not what may be called destructive; and please notice also that I admit that it is a dangerous practice if carelessly applied. It begets an easy habit of putting off until to-morrow what might be done to-day, and with careless patients, who do not return for frequent examinations, it may result disastrously. But it contains a principle of practice of great value, and one which applies with peculiar force to the very best class of patients that can be found anywhere,—that is, patients who can always be depended on to come at stated periods of the year for careful examinations. I have never yet seen a patient so rich or so exacting that I have not, under certain conditions of the teeth, promptly applied it as I would and do for my own children.

Instead of being a careless practice, it is a most careful one, and is susceptible of conferring a great benefit on the patient, and of being a great relief to the operator. It saves pain and expense, and renders the practice of dentistry bearable to both patient and operator.

Patients often remark what a difference between the gentle practice of to-day and that of the time when they were children. It was then a nightmare; it is now not a pleasure, but it is at least bearable. Some patients, before they comprehend its advantages, may think it a careless, lazy practice, and some dentists who do not look below the surface, but run on in the old groove, may consider it a makeshift; but these are enlightened days, and it has been my experience that most patients have a great deal of horse sense, and when taken into one's confidence, and told in a few frank, honest, earnest words the reasons for this practice, they readily acquiesce.

At about the fifteenth year the teeth have become so hard that the question of the use of gold must be seriously considered. After this time many of the arguments I have made vanish into thin air. Yet I must say that I carry along quite a number of people in moderate circumstances for whom I apply this practice, about as described, until far beyond the fifteenth year, and some for whom I continue it indefinitely. When second childhood ap-



proaches and the senile condition appears, it applies again with equal force,—I might almost say, with greater force in some cases. Some one has said that there is an eternal fitness in things throughout the universe. Since teeth must decay, how fitting and fortunate for humanity that we have such beautiful materials as gutta-percha, tin foil, and oxyphosphate! If I do not couple amalgam with these, it is not because I do not use it, or because I have not respect for it, but rather, perhaps, because I cannot take quite the same pleasure in its use. It is not one of my pets,—it is one of my necessities. I do not include gold, because that is peculiar, and stands by itself, unrivalled still when used in its proper time and place.

The work of developing a set of teeth for a growing child is the most satisfactory of any professional work of which I have any knowledge. The physician, bowed with the fearful responsibility of life or death, gropes more or less in the dark, uncertain if his medicines really kill or cure. His problem is so complex that there must always remain a doubt, and though he has all the wisdom of all the ages, his patients must finally die. The surgeon, with better opportunities for exactness, and with the inspiration that springs from the more than marvellous advances that have been made in these recent years, cannot always make his patients live. But the dentist, full of reverence for the way in which Nature works, and recognizing the hinderances that prevent the fulfilment of her perfect purpose, can, by his deft fingers and steady brain and loving heart, give such aid and direction to her efforts, that his life-work may be a perpetual blessing to those who intrust themselves to his care.

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## FOODS.<sup>1</sup>

BY PROFESSOR R. W. GREENLEAF.

MR. PRESIDENT AND GENTLEMEN,—I ask your indulgence in presenting these few remarks this evening; they are not to be taken as a paper, but simply as a substitute for one. A few days ago, I was asked to say something at this meeting in place of one of your members. I asked my friend what I should bring before

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<sup>1</sup> A Smoke-Talk before the Harvard Odontological Society, September 28, 1898.

you and whether you would be likely to be interested in the subject of "Foods." He said, "By all means."

I shall assume that much of the knowledge of foods is thoroughly familiar to you,—that is, the parts relating to the first features of digestion,—I mean the importance of having and using good organs of mastication, but I should like to bring before you certain other phases of this question which the profession of dentistry would do well to review from time to time and to which they have an especial opportunity of calling the attention of the laity. There are certain food questions which are of importance to whole communities, such as towns and cities, on which professional men should be thoroughly equipped, and it seems to be wise to bring these matters before you.

One of these questions might be called the municipal phase of the food question. I do not think most of us realize the importance of securing an absolutely pure food-supply, or of the difficulty of obtaining one. It is absolutely necessary for us to have good food. Certain of the foods may be brought to us in good condition, for instance the various starches of the cereals and dry foods. Grains, flours, etc., may be kept for an indefinite time without undergoing any deleterious change, but it is not easy to keep such foods as meats, milk, and vegetables. And we have also another feature to guard against in this matter of food-supply,—that is, adulteration. Certain of these dry foods may be adulterated by various things, and we also know that milk and substances of that nature, besides being adulterable, may undergo such changes as the simple putrefactive change. It is to prevent these deleterious changes that arise in these products that laws are made and our State boards of health have the power to enforce them. They have inspectors who from time to time visit markets and places where foods are offered for sale, and if any adulterations are found, those who sell them are punished according to law. In this connection it is curious to note the contrivances that are adopted by dishonest men for the purpose of adulteration. Take, for instance, coffee, from which we have been deriving so much pleasure this evening. Sometimes pease are steamed and browned over and made to resemble the coffee beans. When ground one would hardly detect this imposition with the eye. Again, certain of these men adulterate coffee with brown bread, which is crushed and tightly pressed into moulds of the size and shape of the coffee bean, so that it is difficult to distinguish it from the genuine article. Of course, microscopic and other tests enable one to distinguish them easily.

Besides the State boards of health, we have local boards who adopt similar precautions and appoint inspectors with authority to prosecute those who are found offering for sale adulterated foods, and we hear from time to time of the vast amount of work which our own inspector is doing. We also have inspection of other departments, as, for instance, the slaughter-houses and certain manufactories, etc., but with all this we are sadly deficient as regards proper care for these supplies. The national government has an especial corps of officers for the inspection of animals to be sent to foreign ports, and the system of inspection is so thorough that it is difficult to find diseased meat of any description leaving this country, but it is not difficult to find tainted meats in our markets. We are not as well protected in this matter of meats and foods by our own government as we are protecting the people of foreign countries.

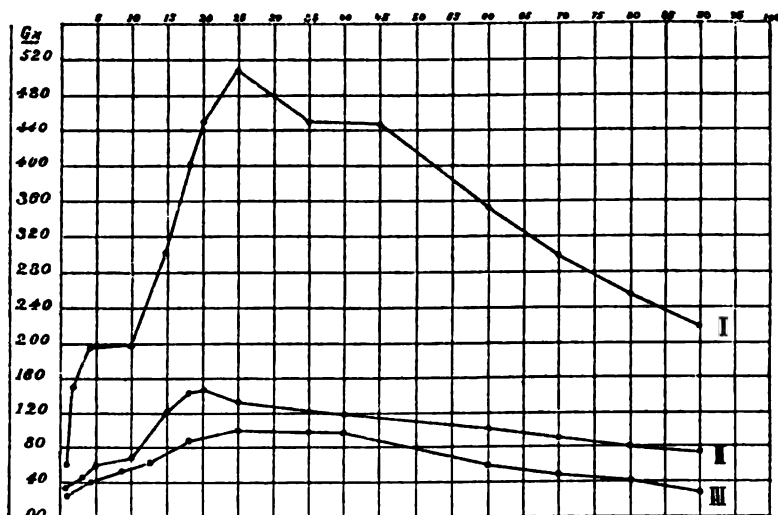
It is incumbent upon us to see that our meat-supply is kept in good condition, and that we should use our influence to see that our markets be daily inspected by competent people, so that under no circumstances should meat be sold which is liable to produce disease. We can assist in getting a better food-supply by spreading knowledge in regard to things of this character, and when people understand these things more fully they will adopt stronger measures against those who sell tainted canned foods and meats and adulterated milk, butter, etc. We often hear of cases of sudden poisoning following dinners, repasts, and the like,—I do not anticipate anything of that kind after this delightful dinner,—but we know that certain of the foods used on such occasions may have contained some poisonous substance. Cases of poisoning may arise from the use of canned goods in which have been introduced substances for the preservation or coloring of the foods. A more common source of cases of sudden poisoning from eating canned or tainted meats, fishes, etc., is the presence of an active alkaloid poison, comparable to the alkaloids of such drugs as digitalis, conium, veratrum, etc., which may develop in decomposing organic matter as a result of the growth of bacteria. These poisons are called ptomaines, and are extremely active agents. Therefore, we should see that everything is done to secure a most perfect supervision of our markets, canning establishments, etc., and that no foods are sold which will in any way endanger the public health.

Professor Sedgwick has shown that milk in its early stages, directly after being obtained from a healthy cow, is free from any kind of germ-life; also, that soon afterwards it becomes con-

taminated with germs which get into it from the surrounding air and multiply with extraordinary rapidity, so that in a short time the milk may be completely spoiled. These germs may be harmless, but just in the same way that harmless germs are taken in so are the poisonous ones likely to get in, supposing they are about, so that it is necessary for us to take the greatest care in such particulars, and not simply take it ourselves, but to help spread a general knowledge throughout the community of such matters. The ignorance of people in intelligent communities on this subject is surprising. Milkmen, even in a city like Boston, have been found to be cooling their milk in cellars that were improperly drained, and in many houses you will find that such things as cakes and puddings are allowed to be cooled in damp and improperly-aired places.

Now, I would like to say a few words in relation to quite another department of the food question which it seems to me is not generally comprehended, and which might be understood with considerable advantage. You are familiar with the fact that food, as such, consists of elementary substances of four different kinds. The first of these is called the carbohydrates, and under this head are included such foods as the starches and sugars found abundantly in cereals; also to some extent in animal foods. Next in the series are the proteids, which are represented by the albuminoids that are contained in the various meats, but are also found in vegetables, as pease and beans. Besides the proteids, we have the fats, as in butter, milk, cheese, meats, and in certain vegetables. The fourth element consists of the mineral matters, of which but a small portion is necessary to the system. The relation of these four classes of foods, the relative proportion in which they exist in vegetable and in animal foods, their necessity for the healthful operations of the tissues of the human body, and the life-energy resulting from them are not commonly known, and it would be of great benefit if more thought and attention were given to this subject. I will call your attention to this chart, which will give you a relative idea of the approximate requirements of the body of the different kinds of foods at different times in the life-history of the individual. This upper line represents the amount of carbohydrates needed; the second line the amount of proteids, and the third line the amount of fats. Now, in speaking of this, let me say that the amounts of working force may be measured in definite terms. You know that in physics you can measure the foot-pounds of any given force, and so we may measure the amount

of life-energy that food will accomplish in the body. The unit of measurement in this case is denominated a calorie, and the amount of work which a calorie will do, or, in other words, the meaning of



Curves from calculations of Mrs. Ellen M. Richards, Massachusetts Institute of Technology.  
I. Carbohydrates. II. Proteids. III. Fats.

the word calorie is, the work required to raise the temperature of one kilogramme of water one degree.<sup>1</sup> This will give you something of an idea of the way we arrive at the amount of work that food will accomplish in the body. (While I am speaking I would like to pass about these charts, which have been prepared by Professor Atwater, of Wesleyan University, on this subject, showing the composition of various foods and the amount of energy which each will develop in the system.) To return to our diagram, if we take the amount of nutrients needed by individuals at different times in their life-histories we find that they vary. These vertical lines represent the age of the individual, and these horizontal lines represent the amount in grammes of the nutrients needed at the different ages. In infancy we know that starches are not needed, the stomach is not able to digest them, and that is the reason why nothing but milk is allowed to an infant. Very soon, when the teeth appear

<sup>1</sup> In one gramme of carbohydrates are 4.1 calories = 6.8 foot-pounds.

In one gramme of proteids are 4.1 calories = 6.8 foot-pounds.

In one gramme of fats are 9.3 calories = 12.2 foot-pounds.

These are tentative estimates from the researches of Professor Rubner.

and the child gets stronger, there is need for other kinds of food, and this need is best supplied by the starches, so that, according to this chart, at the age of five we find that the line of carbohydrates overtops the line of proteids by a considerable amount; that in turn overtops the fats. At ten years the proportion is not very different. But from then on the line of carbohydrates ascends rapidly and reaches its highest point at twenty-five years, and from that time it gradually falls until in old age it approaches the other lines, as in infancy. You will observe that the relative amounts of proteids and fats needed are much less than the carbohydrates all through life.

There are many ways in which we differ in our dietaries from the people of foreign countries. It appears that more fat is eaten in this country than is eaten abroad, and we are apt to overload ourselves with too much meat. On the other hand, we are altogether given over to a too limited range in our diet. It is curious to note that we seldom find certain vegetable dishes—such, for instance, as salads other than lettuce—eaten in this country, whereas there are various other salad plants which might be eaten with advantage. Such things as cheeses are also too little used. You will sit at many a table where cheeses are taken scarcely once a week. Now, the various cheeses are very rich in proteid elements, and might profitably be added to our diet. So it is with fish. It is striking to note what a comparatively small part fish has in our diet, even in our seaport towns. In one of the tables that I passed about, Professor Atwater has given the food value, *i.e.*, the amount of “nutrients,” the carbohydrates, the proteids, and the fats, also the working force, the calories, of a large number of fishes. He also shows the importance from an economic stand-point of eating more kinds of fish than we do. If you will notice the fish to be had at our markets and restaurants, you will see that it is limited to a very few kinds, such as cod, halibut, etc., whereas there are a large number of fishes in our waters that might be used.

In looking over those dietaries of different individuals, it is instructive to note that many of the hard workers, such as lumbermen, do not rely so much upon meat as one would suppose, and so it is with the German soldiers, although there is no more healthy class of men known to-day. Now, if you compare such a diet with that of our old training tables, you will very likely find a great difference in the amount of meat taken. In the training tables of years ago, and in some places nowadays, meat was the great standby, and was given at every meal almost exclusively, under the sup-

position that it was readily converted into muscle, that being supposed to be about all that was necessary for an athlete. Under such a course of diet we found our athletes suffering with boils and like cutaneous disturbances, largely owing, no doubt, not simply to over-exercise, but to the absolute starvation of the system for certain necessary foods. In the training tables of our college athletes of to-day, the diet does not include relatively so much meat, as various vegetables, fruits, etc., are freely eaten. It is based on a more scientific knowledge of the requirements of the system, and such matters as boils and breakdowns are practically things of the past. These dietary tables of Professor Atwater's represent the dietaries of our college athletes of to-day,—that is, our foot-ball players and oarsmen,—and are compared with dietaries of other classes of people at home and abroad.

There is one other problem of this nature which it seems wise to mention, and that is in relation to the proper methods of cooking foods. Of course, this is a very extended subject, and I will not take up much of your time with it. Our good old ranges and stoves and the like will accomplish wonders in the way of preparing our foods, but, in spite of our affection for them, they have their shortcomings. They are a particularly wise way (if the expression can be so used) of increasing the cost of cooking; in other words, our common methods of cooking are extravagant and wasteful. They are extravagant, first, in the cost of fuel, and secondly in wasting the products given off in smoke, which might be retained. A short time ago a dinner was prepared for one hundred and fifty physicians, which included various kinds of soups, escalloped oysters, various kinds of meats, vegetables, and puddings, forming an excellent dinner, and the cost of fuel—viz., oil in lamps—for cooking that entire repast was but fifteen cents. The fuel for such a dinner cooked by ordinary methods would have cost many times that amount. Much of the nutritive value of our foods is wasted for the lack of better ovens and appliances for saving the products of the substances. One method of accomplishing these results is by the use of Mr. Atkinson's "Aladdin cooker." It is rather an expensive cooker, but in time will more than save its first cost in the amount saved for fuel; moreover, cheaper forms of cookers may be used, and will answer the purpose just as well. By such a method of cooking, which is a matter of great importance, the products of cooking are particularly satisfactory. If we have well selected meat and we give it a proper length of time in our ovens, the results are usually good; but there are many persons

who are unable to buy the best cuts and must be content with the inferior ones. Now, a cooker of that description, by the slow process which it necessitates,—never raising the heat above the boiling point, and steadily maintaining it,—will convert these tough steaks of our boarding-houses and cheap restaurants into food as tender as the fillet which we have been eating here. Now, that is a great thing to know. I have several times tasted meat taken from the cheaper cuts of animals, which we commonly think of as too tough to put on our tables, and have found them as agreeable to the taste as if they had been the most expensive selections. They tasted fully as good, although they did not always have the rich brown color obtained by broiling over a very hot fire: the color was somewhat paler. I do not mean to say that you should procure one of these cookers and then buy only inferior grades of meat, but where economy is aimed at, it is well to try methods that will produce methods of such great economy. This method is also very satisfactory in the cooking of the cereals and in the making of soups, and it is surprising to note the delicate flavors which are brought out. Of course, we all know that a pea soup which is cooked at home is vastly different from the partially cooked soups of our restaurants. The cause of this difference is found in the fact that in the restaurants they are cooked quickly over a hot fire, while the cooking of that kind of food should be by a slow process rather than a rapid one.

There is one other phase of the food question which I wish briefly to refer to, and, although you may be well informed in regard to it, you must remember that others are not equally so, and you might by your co-operation help us physicians very distinctly in the matter of looking out for the general health. Oftentimes patients go to you regarding their teeth who do not think themselves ill enough to need medical advice. They may perhaps have a feeling of depression or other indefinite ailments. On examining the teeth you find that they show evidence of lack of proper nutrition. It may be that they are simply run down, and a little tonic will relieve them at once, or it may be that they are practically starved for certain foods. Now, this question as to what underlies their condition is often a difficult matter, and it may be hard for you to say whether it is simply of a digestive nature or because certain substances are not being supplied, and in such cases you are doing the patients a great service if you put them on the track of being attended to; and so there are various other conditions in which the two branches, general medicine and



dentistry should work together. You sometimes find that by injudicious advice various medicines have been given which tend to ruin the teeth, and it would be greatly to the advantage of the people if they could be more thoroughly enlightened as to the effect of certain mineral acids which are still prescribed by some physicians, though not so frequently as they were ten years ago, and the same might also be said of the acids associated with many foods. Certain of them may be injurious,—for instance, the acid of grapes, where the custom is to chew up the grapes. Many people also have a habit of eating lemons, which are said to be injurious to the teeth. It would be a great service to have the exact status of such facts brought clearly to their minds. And so with another allied question, the diet during the stage of lactation. Oftentimes nursing women so restrict themselves in diet as to be really starving, and if we but knew that they were ailing they might be materially benefited. Of course, it is the physician's business to look out for such matters, but in many instances he has no opportunity for doing so, as the patient does not think it necessary to seek his advice on such matters. When such cases come to you, you can do a great deal of good by your advice. It is a question of some delicacy to say exactly what attitude you should take in regard to those things. If you have studied all medical questions and have familiarized yourself with the various symptoms indicating the patient's trouble, it is your privilege to go ahead with them the same way as any one else would and prescribe medicines for them. In Massachusetts there is no prohibition in regard to this. On the other hand, in the same way that specialism exists in certain departments of dentistry, and as you refer certain work to those specially familiar with that class of work, it would be a safe rule to consider all such as special questions to be referred to a physician who is undoubtedly familiar with them, because they may not simply involve immediate effects on the teeth, but they may involve the general health of the patient; and, again, the facts in the case may be very far from what you supposed them to be. At all events, as such cases do not pertain to your own specialty you are not making any mistake by referring them to the medical practitioner.

PHYSIOLOGICAL AND PATHOLOGICAL CHANGES IN  
THE ALVEOLAR TISSUES, FROM OPERATIONS FOR  
CORRECTION OF IRREGULARITIES OF TEETH.

BY DR. J. N. FARRAR.

*Theory.*—Teeth are moved through absorption of the socket-tissue, or by bending of the alveolar ridge, or both. This absorption or this bending may take place by the tissue-alterations being carried on within their physiological functions, or they may take place outside of these healthy functions and in the pathological. If the tissue-changes can be conducted within the physiological functions, the operation of moving a tooth will be painless. But if the changes are pushed beyond this condition, and into the pathological, the operation will be more or less painful.<sup>1</sup>

Any regulating mechanisms that can be controlled so as to confine the tissue-changes within the healthy line are therefore superior to those that cannot be so controlled. Mechanisms that operate by elastic rubber, or by metallic springs, if the power be not so great as to force the changes to exceed healthy action, will be comparatively painless, but to so control elastic materials that they will not cause pain is difficult, and generally impossible.

This is not the case when mechanisms operated by screws can be used, because by the screw exactness of action can be secured, and (exactly) the proper degree of force can be given. Especially is this true when the management of the mechanism is left to the patient, who knows better than the operator when the greatest degree of force can be given without causing pain.

When these facts are clearly understood and are carried out by a skilful operator, the prejudices of patients against regulating operations will be overcome, and reputation for high skill will begin. This desideration is assured by the screw making it possible to take advantage of the "Law of Labor and Rest," which applies to these tissue actions as well as to other tissue energies.

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<sup>1</sup> Before Dr. Farrar began to publish (in 1875-76) the results of his investigations in tissue-changes caused by pressure, it was the universal belief that the movement of teeth was "only possible through pathological difficulties."

## Reports of Society Meetings.

### ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular monthly meeting of the Odontological Society of Pennsylvania was held December 9, 1893, at the Hall of the College of Physicians, Thirteenth and Locust Streets, Philadelphia.

The President, Dr. Darby, presided.

On motion of Dr. Kirk the general order of business was suspended.

Mr. William R. Newbold, being introduced by the President, read a paper entitled "The Psychological Aspect of Hypnosis."

(For Mr. Newbold's paper, see page 92.)

Dr. Thomas Fillebrown, of Boston, was called upon to open the discussion.

#### DISCUSSION.

*Dr. Fillebrown.*—MR. PRESIDENT AND GENTLEMEN OF THE SOCIETY, —I understand I am expected to speak of this subject to-night in its application to dentistry, and thus give a direction to the discussion more positively towards our own specialty.

It must be evident to every one that hypnotism is a many-sided subject and that it makes all the difference in the world from which side we view it, as to the opinion formed of it, as to our expectations of what it will accomplish, and also of what it will not accomplish. I shall speak only of its sedative and obtundent effects, and in this quiet aspect stage performers, of which we have so many, would not even recognize it. A statue presents many aspects. One sees the statue of Franklin from the front, another from the back, then again another sees the side view. Now, if any one were to give a description of the front of the statue, it would give no idea of it to one who had seen only the back. Then, again, how many-sided is personal character! A delineation of the Saviour scourging the money-changers from the temple gives no conception of Christ bringing the widow's son back to life, or of his weeping over Jerusalem. Scientific subjects present the same difference of views. The law of gravitation when studied in relation to the movements of the heavenly bodies and the existence of the earth appears the beneficent power that it is, but when observed as the power that impels the destructive avalanche or sinks a town when the earth-

quake opens the earth, it seems the embodiment of evil; but beneficence is the rule and evil the exception. The study of medicine in overdose makes it a system of destruction and death, but studied in its proper and rational administration it becomes for "the healing of the nations." Now, we must not judge opium, ether, chloroform, or nitrous oxide by the extravagant exhibitions that may be made. We must not judge the normal effects of opium by the tale of an opium-eater; nor of ether or chloroform by the extravagant effects produced upon those habituated to their use. We properly judge anæsthetics first by their stimulating and strengthening influence, then by their anæsthetic effects and the benefit we get from them during operations. I wish to make this a practical talk, and consequently I take the practical side of it. I find that human nature is most wonderfully susceptible to suggestion in the wakeful state. The blush has been referred to, so has the pallor of fear. We also realize the wonderful effects of joy, and just the bare suggestion of these states brings them about. So with the absence of fear. You take a little child (or a big child, as to that), and you say, "We are feeling quiet." You are assured yourself. Your own presence is suggestive of courage, and you say, "Indeed, we are not afraid," and the troubled heart is stilled at once; the child walks along with you or, it may be, goes independently at your suggestion without any fear or trembling whatever. I have seen suggestion over and over again quiet circulation where the patient was in a perfectly wakeful state, the circulation being perturbed and uneven; and just the quiet suggestion that the circulation was becoming even brought about the result.

I remember one patient I had who wanted to take an anæsthetic to have a tooth out, but would not hear to the use of hypnotism at all. She would have nothing to do with it, but was terribly perturbed, the pulse 120, and by simply suggesting to that patient that the heart was becoming still and that the pulse was growing less, within three minutes it lessened twelve beats, and in a few minutes more I had removed all her disturbance and she was entirely quiet and breathed the anæsthetic without any resistance or disturbance whatever.

In the hypnotic state this condition is increased wonderfully. The receptivity is increased. That has been described, and I need say nothing more about it. It has been my fortune, I believe, to be among the first to make it practical in its application to dentistry. You know very well that a good many years ago—about 1845—Dr. Esdaile, a surgeon in the English army, while stationed in

Calcutta made a record of nearly three hundred major surgical operations under hypnotic conditions, and the patients were absolutely anæsthetic and knew nothing about it and did not suffer. Now, the Eastern nations are more susceptible to hypnotism than the people of this changing and more temperate clime, and here it cannot be depended on in any great number of cases. It is one only out of about twenty among our people that become somnambulist. If it were to affect but one patient out of twenty it would be of no good to us. After studying the subject and putting two or three things together, one from Bernheim and one from my friend in Boston, Dr. Osgood, and one or two others, I made up my mind that the lighter forms could be made continuous and would be of use in dentistry. I learned to so use it, and found it even true, and it was a great pleasure to me and has been to a great many patients since. When I first commenced I followed Bernheim's directions and believed the fixation of gaze necessary, and directed the subject to look at my fingers or on some bright object, but later I found it unnecessary, and recently it seems to me that formality of movement or manner is not required, and I can hypnotize them just as readily without as with it. Of the methods I will speak later on.

I will now illustrate by a few cases where suggestion, without any pretence to hypnotism, has proved effective. One was a lady that I operated for within ten days. She has been a patient for a good while, and has no sympathy whatever with hypnotism. She was willing her little boy should be hypnotized, but would not think of such a thing for herself. She was in the other day and had an inferior molar tooth that needed filling. It had been filled previously, and the filling came out because of her utter inability to have the cavity put in proper condition. It needed refilling, but was so sensitive she could not bear to have it touched with the excavator, much less with the engine bur. I commenced deliberately with her, talked to her the same as I am talking to you now. I said, "This tooth is becoming anæsthetized. This dentine is becoming less sensitive. Your fear in regard to it is going away. You will be able to let me cut this without your suffering pain, and you will not mind it." I talked to her in that way and took my engine and went to work and cut it. She did not shrink; she did not suffer. She was so amused at it that she laughed and said, "I know all about this. I know what you are saying, and I acknowledge it does not hurt me, but I cannot understand it." A case like that is wonderfully illustrative to me of the power of suggestion. I cut the cavity just as I wanted it, and she absolutely did not suffer.

Another case occurring within the last ten days was that of a woman who was boarding at an institute for nervous patients and who was nervously depleted. It has been almost impossible for her to have operations performed on her teeth because of the disturbed, restless condition and her fears. Her condition was such that the moment I attempted to do anything upon her teeth she became almost rigid, shrinking away as I touched her teeth so I could hardly get near her. Of course it was of no use to talk hypnotism to that woman. I would not have mentioned it on any account, but I did commence with the same kind of suggestion that I did with the other patient, and the result was that in four sittings averaging nearly two hours each I was able to work along steadily at the teeth and do what I desired. At the last sitting the patient became tired of the monotonous talk, and she said she wished I would not talk so much,—it made her nervous; and the minute I began after that she again straightened up, and I had hard work to finish at the last sitting. She had become thoroughly weary and needed rest. When she comes again I can repeat the same process.

Another case is that of a little girl, much disturbed, crying, and unable to let me touch her teeth. I repeated the same process and had no difficulty whatever.

Another case is that of a patient troubled a great deal with headache. Last spring I cured her of a severe neuralgia and headache. She went out of town for the summer and was to let me know if she had any return of her troubles. After a while she wrote me that she was troubled again with headache, and I replied, saying that it would pass away as soon as she read what I had written, and she wrote saying that it was relieved so quickly after she read my note that it frightened her. That is a repetition of what has been done many times, and has nothing at all new in it.

I often now induce hypnotism by simply closing the patient's eyes, putting my hand on the forehead and bringing it down over the eyes to shield from the light, and simply say to the patient, "You are growing quiet. Your feet and limbs are growing sleepy. Your feet, your hands, your arms, your body, are growing sleepy. Your head is growing heavy and sleepy. Your eyelids are growing sleepy." I find in most cases this is all that is necessary.

You can do the same thing and do it in the same way. I notice here my worthy friend Dr. Jack. You all know what a soft, penetrating voice he has. If he talks to the patient and says, "Now keep quiet under this. You will not fear,—your fears are going away. If you will just relax yourself, as I know you will when

you sit down in the chair,—if you will grow heavy in the chair and let all your limbs grow heavy, you will find this will all pass away.” And when the patient is in that condition, if he will say, “The tooth is becoming anæsthetized. This dentine is becoming anæsthetized. This will not hurt you,—if it hurts you you will not mind it,—it will not shock you,” the condition suggested will be sure to obtain. That creates a smile, I know, but if you will study hypnotism and its phenomena and its application to dentistry you will find many places where it will not only excite your mirth, but it will excite amazement, and you will find that to-day we do not half understand human nature. It has been remarked in the paper that this is one of the faculties of human nature which we are just beginning to recognize and understand. It makes all the difference in the world whether you make a half-hearted statement or a positive one. If you take a patient and are afraid yourself that you are not going to accomplish anything, and say, “I guess this won’t hurt, but I am afraid it will,” you just excite fear enough so that it will surely hurt; but a positive statement has a positive effect on the human mind. I think myself that the hedging, as I facetiously remarked, “if it hurts you you will not mind it,” is more to accommodate the operator than the subject. A great many patients say that if it does hurt it is only at the point of contact, it does not extend over the whole system, and that they feel no shock from it.

Often a suggestion will not apply to a whole cavity at a time. In such cases I anæsthetize it in sections, so to speak. I say, “This is anæsthetized. You will not feel this. I can cut it without hurting you.” This will serve for a part. On reaching another sensitive point I say, “Wait a moment and this point will become anæsthetized. It is anæsthetized now. Now the pain is going away,—now I can cut it away.” Thus attacking new sections and making the same suggestions, I cut clear around the cavity and complete it. I know by your looks that you are incredulous. I was until I tried it; but I say upon my credit for making honest statements, that I have seen these things over and over again so many times that I cannot resist the conclusion that it is a natural physiological effect and one that we have reason to accept. It is no chicanery and no invention. I wish to enforce upon you all the necessity of repeating these suggestions. I found that operating roused the patient from the condition, and the way I overcame it was by continual suggestion. I keep the suggestion going continually to offset the waking process.

The dangers mentioned by the essayist unquestionably exist. I also recognize that in suggestion we have the remedy which will absolutely and entirely insure against them,—indeed, a veritable “*similia similibus curantur*.”

Bernheim testifies that “hypnotic sleep is as free from harm as is ordinary sleep, and in a long practice I have never seen any harm produced by sleep induced by the Nancy method.” (At this time Bernheim had induced hypnosis over ten thousand times.)

Liébeault in thirty years' practice found no trouble whatever.

Heidenhain, of Breslau, says, “Hypnosis under the direction of medical men is harmless, and may do much good.”

Drs. Moll, of Berlin, Voisin, of Paris, Tuckey, of London, with a host of others in Europe and America, express the same opinion.

In my practice of two years I have never seen a patient experience any trouble whatever. And I have not yet met any operator who had any intelligent practical knowledge of the subject who has observed the slightest sign of danger or trouble.

The President stated that Mr. Newbold would give a demonstration of hypnotic suggestion, and after that Dr. Daland and Dr. Ottolengui, of New York, would address the Society.

Mr. Newbold, taking the stand, said, “I almost feel that I owe you an apology for offering to show you the phenomena of hypnosis. I do not doubt that many of you are better acquainted with these phenomena than I am myself, and neither need nor care to see them again. I have, moreover, such a cordial detestation of public exhibitions of hypnotism that I do not like to put myself in the position of giving one. I have, however, been pressed to show you the phenomena of which I have spoken, and have consented chiefly because I feel that this audience is actuated by a desire to understand the problems involved and not by any vulgar curiosity. I think it is also due to the two gentlemen who will permit me to hypnotize them to-night to state that I have no mysterious ‘control’ over them except what they give me. I hypnotize them with their full and intelligent consent, and could not do it without it.”

Mr. Newbold, taking the first patient, said, “This patient is very susceptible, and he very readily goes into the state upon mere suggestion.”

He then seated the patient in a chair upon the platform, passed his hands over his face, closing the eyes and talking quietly, saying “that he [the patient] could hear nothing except what he was saying to him; that he could hear nobody else; that he could not



open his eyes, and that he would wake him up when he was through with him."

Having brought the first patient into the desired state, and leaving him sleeping in the chair, Mr. Newbold introduced the second patient, stating that he was a candidate for the doctor's degree at the University of Pennsylvania, and had been studying psychology; that he was a peculiarly interesting subject because he did not go into a very deep hypnotic state, but remained thoroughly conscious all the time he was asleep. "It is difficult to put him to sleep, and he is a thoroughly good witness of the phenomena of hypnotism. He belongs pretty nearly to the first class, in which the motor system is affected, while the sensory system is but slightly affected."

Seating the patient in the chair, Mr. Newbold gazed steadily at him for perhaps two minutes, swaying his (Mr. Newbold's) head and body backward and forward and up and down, neither operator nor patient relinquishing the gaze into the other's eyes. Mr. Newbold suddenly exclaimed, "Shut your eyes!" This the patient did, Mr. Newbold stroking his face and eyelids for a few moments afterwards.

Mr. Newbold then proceeded to illustrate the production of anæsthesia and contractures by suggestion, showing incidentally that patient B was not as suggestible as patient A.

Addressing the patient, Mr. Newbold said, "You can't feel anything in the right hand." Then rapping it and asking the patient if he felt anything, the patient answered, softly, "No."

"Now," said Mr. Newbold, "you can feel;" and rapping the hand, asked if he felt anything, the patient responding, "Yes."

Mr. Newbold put the patient's hand up, and said to him, "You cannot bend it;" also placed the hands together, saying, "You can't open them;" but in both instances the patient did, in a slight degree, bend the hand and open them.

Going to patient A, Mr. Newbold put his hands together, and said, "You can't open them. Try." The patient did not open them. "Now you can open them," said Mr. Newbold, at which the hands were opened. Mr. Newbold told the patient in a number of different experiments upon the hands that he could or could not feel, and, upon questioning the patient, upon touching the hands, the response always indicated that the sense of touch was in the operator's control.

To illustrate spontaneous catalepsy, Mr. Newbold put up the patient's arm, and it remained up. He then said, "Thomas, you

cannot take your arm down." After being suspended for some moments, Mr. Newbold pushed it with considerable force downward, but it still remained supported. Upon directing the patient to let the hand fall, he did so.

Mr. Newbold then gave illustrations of the production of hallucinations by suggestion. Turning to the second subject, B, he said to the patient, "Open your eyes." This the patient did. "You see that private room in the University where we meet Tuesday evenings and discuss psychology?" The patient responded, "Yes." "You see persons in the room, but there is no table. Do you see a table?" Answer: "Yes." Mr. Newbold: "But I tell you there is no table. Do you see a table?" Answer: "Yes." Mr. Newbold here called attention to the fact that he was not able to dissociate the parts of the hallucination, but only to suggest it as a whole.

Mr. Newbold next showed how negative hallucinations are produced. "Open your eyes. I am getting dim and fading away. You can see me dimly. Am I getting dimmer?" Patient: "Yes." "Tell me when I am gone. Do you see anything?" Answer: "Yes."

Mr. Newbold stated that he had sometimes succeeded in blotting out the patient's vision, but only for an instant. "The production of positive hallucinations of vision is not anything remarkable in the case of patient B. He is a good visualizer, and can see anything he wishes at any time. These hallucinations never occur spontaneously, but he can produce them voluntarily."

Mr. Newbold then showed that he could not cause negative hallucinations of hearing in the case of patient B, but could in that of patient A. Mr. Newbold said to patient B, "You are deaf in this ear and can't hear. Do you hear anything?" Putting watch to his ear. Answer: "Yes." Drawing watch away, "Hear anything?" Answer: "No." Putting watch closer, "Hear anything?" Answer: "Yes; a watch."

Going to the first patient, Mr. Newbold said, "Thomas, you can't hear anything except what I say." Mr. Newbold snapped his fingers close to his ear and knocked on the chair close to the patient's head and asked if he heard anything. The response was, "No." "Now you can hear," said Mr. Newbold, and, knocking, said, "Do you hear anything?" The response was, "Yes; a knock."

Mr. Newbold then stated that he would like to show how sensitive the hypnotized patient is to every word uttered by the operator. He raised the right arm of patient A, touched it lightly without saying anything, and waited a few moments. The arm

slowly descended and the left arm very slowly rose to about the same height. Mr. Newbold explained that twice, the last time six days before, he had remarked in the presence of the patient, but to a third person, that the effect of touching first the right and then the left arm would be to cause the right to descend and the left to rise. The suggestion had proved effective on both former occasions, and at the time of the second experiment the first was found to have been forgotten. On this third occasion, however, although six days had elapsed since it had last been tried, the subject still remembered that apparently chance remark. The extreme slowness of the movement probably indicated that the suggestion was much weakened by time.

Mr. Newbold then performed an experiment with subject A, designed to show, first, that the hand anæsthetized by suggestion is not truly anæsthetic; second, that the sensations received through it, although not felt as sensations of touch, may serve as *points de repère* upon which to construct complicated hallucinations of vision.

Going to patient A, Mr. Newbold, holding a coat between the patient's eyes and his hand, said, "When I put anything in your hand you will see it on that table over there, but you won't feel it. This hand has no feeling whatever" (putting a knife in his hand). "What do you see on the table?" "Something like a knife." Mr. Newbold held the knife in different directions in the patient's hand, and the responses from the patient were to the effect that he saw it on the table indicated accordingly as it was placed in his hand. The same experiments were made, using a watch instead of a knife.

Here Mr. Newbold woke the patients up, telling them they would feel no disagreeable sensations nor headache; that no one could put them to sleep against their wills, and that they would never go into the state accidentally.

Addressing patient A (after he had waked up), Mr. Newbold said, "Now I shall try to put you to sleep, but don't go to sleep unless you want to. Make up your mind you won't. You must try to stop me." He then tried to hypnotize A for a minute or two, but without success. With this he closed the demonstration.

*Dr. Ottolengui.*—Some years ago I was very much fascinated with the idea of becoming a hypnotizer. That was when I was entirely ignorant of the subject. After I really learned to hypnotize I soon abandoned it in dental practice for several reasons, not the least of which was that it did not seem professional to hypnotize one against his or her will; and I very quickly learned that it would be a disadvantage to me if it got out among my patients

that I was in the habit of hypnotizing people, because of the ignorance of the community and the dread of getting into another's power.

You heard Dr. Fillebrown say that at first he used the method of concentrating the gaze upon a bright object, but he had finally abandoned that because he thought it preferable to have the eyes open. Now, while I do not absolutely hypnotize nor attempt to hypnotize, I not infrequently close the eyelids and rotate the eyeballs through the lids when presenting suggestions, because I think that is the quickest way to produce mild hypnosis. Whether true or not I don't know, but my experience seems to substantiate the theory that there are absolutely what has been called hypnogenic zones in the body, and that they very frequently lie back of the optic nerve. Now, you may ask how closing and rotating the eyeballs can have any effect; but I need only ask you to close your eyes and rub them and see if you do not get a sensation of light, and it is that monotony of light-waves which it is claimed will produce hypnosis.

Before I leave the subject of hypnotism itself I would like to state a little of my experience with it and why I abandoned it. In the first place, I found a very small proportion of people were absolutely hypnotic under my influence, and with these few I met some very unpleasant symptoms; patients becoming difficult to control, and in an hysterical condition afterwards. Another curious thing was that patients would not always speak the truth. That is, they pretended to be hypnotic when they were not. Some patients had just enough knowledge of hypnotism to know when I was about to make an experiment upon them, and they were unwise enough to try to fool me into the belief that they were hypnotic. After studying the subject of hallucinations, of which you had a beautiful example here this evening, I formed a test of this kind which has proved quite satisfactory in exposing several persons whom I had previously supposed to be hypnotic subjects. The test is this: take a white glass bottle and suggest to the patient that it is blue; the patient admits it. The patient will admit it whether he is a fraud or honest, because if he is honest the suggestion will make him see it blue; if he is dishonest he knows you mean him to see it blue, so he says it is blue. At that point you have gained nothing. Now, on the third test I take a yellow glass and hold it before the patient's eyes. The malingerer reports that the bottle is yellow. Why? The light rays passing through the white bottle and through the yellow glass makes him see it yellow. He does not

know what I am trying to get at. But if the patient is hypnotic he will report that the bottle is green, because it has been suggested to him that it is blue; therefore when the rays pass through a yellow medium it becomes green. I would suggest to a hypnotizer that this is a very pretty experiment to try.

Not only do I believe that there is no person who is not liable to suggestion, but I believe there can be no word spoken which does not carry suggestion with it, in consequence of which we should be very careful what we say to our patients. We see that in the effect a newspaper has on its readers. People who read a certain paper and no others, swear by anything they see in it. The publishers of that paper take advantage of this, especially in a political campaign. Take a Democratic paper. You say the Republicans don't read it, but the Democrat who reads it will go among his Republican friends and use its arguments. He does not realize that that is exactly why they were printed.

Dr. Fillebrown told us that Dr. Esdaile was very successful in Calcutta because the natives are very susceptible. When he tells us of his success in Boston we should certainly recognize the fact that the people of Boston are very much more susceptible than those of our own community. Their literature is impregnated with suggestion; faith-cure, mind-cure, and kindred subjects have been poured down their throats and into their brains until they are ready to believe anything at sight; consequently Dr. Fillebrown has an easier community to work upon than we have.

Cocaine was first introduced to this country through the medium of the newspapers, rather than the medical journals. We were suddenly startled by the information that the drug had been discovered; that it could be injected under the flesh and the part painlessly amputated. I very early experimented with it, and found it did not accomplish all that had been promised for it. At first I almost adopted the idea that cocaine was not a local anæsthetic at all, but I am ready to admit that it does have a therapeutic influence. I remember one day going to a clinic when a patient was shown me who had been unable to have anything done to her teeth until cocaine was administered. She had been given injections of cocaine and a tooth had been extracted without pain. Some of my friends said to me that they wanted to prove to me that cocaine was a valuable agent and that in this case suggestion would not work as well. I said I did not object to being proven in the wrong if I could learn something by it. The patient was a little girl about ten years old, with the remaining superior first

molar very much decayed. She said she had had a tooth extracted under cocaine and that it did not hurt. I asked her if she was entirely satisfied that if cocaine were used she would not suffer, and she answered, yes. I told her that I did not believe in cocaine, and asked her if she would have the tooth out with cocaine so that I might see it done. She answered, "Certainly, that is what I came here for." I asked how much her dentist had given her, and she told me three injections of five minims each. I took a similar bottle to the one that had been used before, and giving the three injections, I removed the tooth with all the leisure in the world,—as though I had nothing else to do that afternoon. The child showed no distress or pain whatever. I asked her if she meant me to believe that it had not hurt her, and she replied that there had been no pain whatever. I said, "Gentlemen, that convinces me as to where cocaine stands. What I used was water." They were very much disgruntled, and one of them turned to the patient and said, "Didn't he hurt you? He only used water." She said, "That explains why it hurt me, but I didn't like to say so before." Then they came over to me and told me what she had said. I replied, "The patient is untruthful. Her eyebrows tell the truth: they were not wrinkled a moment whilst I extracted the tooth."

We saw a very pretty experiment here to-night of automatic suggestion, the patient lowering one arm and raising the other. Now, we do not have the same susceptibility in waking patients. We cannot make them quite as obedient as that. In producing an effect by suggestion you must take your patients off their guard; least of all must they suspect that you are trying to influence them by suggestion; consequently I like to add to my suggestions something that they will believe of their own experience. For example, if a patient has a very sensitive tooth, you ask him if he has ever taken chloroform. The answer usually is, "I would like to if only my physician will allow it." I say, "I don't want to give you chloroform, but there is a peculiar thing about chloroform: if you inhale it two or three times, whilst it will not put you to sleep, it will anæsthetize your teeth." The patient says in his mind, "I know chloroform is an anæsthetic. I have no doubt it may influence sensation before it produces sleep; I have every reason to believe the dentist to be honest, because he has never deceived me." That is about what passes through the patient's thoughts. Then take a drop, or as little as you can, and hold it far enough from the patient's nose to be quite out of danger from heart-failure to the most sensitive patient. You ask the patient to tell you when a tickling sen-

sation is felt in the feet, that being the first sign that the drug is at work. A very susceptible patient will feel the coldness coming up at the mere suggestion. Then I say, "Now I will prepare the cavity, and all you have to do is to tell me as soon as you feel any pain; there is no reason in the world why you should feel any pain." There are but few patients who cannot be affected in this way. Although it is true that you can give the patient chloroform in small doses and obtain an influence or sensation long before unconsciousness ensues, the mere suggestion of chloroform will serve in the majority of cases.

I want to tell of a case that was very curious. A patient said she was losing all her teeth because every dentist she went to sent her to some one else. I found her as troublesome as she was reputed to be. She was very hysterical. The instruments hurt her long before they touched her. I finally lost patience with her and determined that at the next attempt I would prepare the cavity. I had no intention of using hypnotism or even suggestion. I said to her, "This is all nonsense about this tooth hurting you." As soon as she discovered I was determined she became rigid. I was alarmed for a moment and tried to resuscitate her, when it suddenly dawned upon me that she had gone into a mild form of catalepsy. I went to work, and after I had completed my filling I said, "It is all over," and she got up instantly. Subsequently she would pass into that cataleptic condition as soon as I closed her eyes. I mention this because she dropped into hypnosis spontaneously.

I find I am getting somewhat of a reputation for not hurting my patients, because for the last two years whenever a patient has said, "My teeth are very sensitive," I say authoritatively, "You will not be hurt; it is the rule of the office never to hurt anybody."

Dr. Judson Daland next took the floor and said,—

"I cannot resist this opportunity of expressing the pleasure I derived from listening to Professor Newbold, particularly in reference to his psychological explanation of the phenomena of hypnotism. This, I take it, is the most difficult problem ever set before man for solution. As to what he has said of the *modus operandi* by which suggestions are carried from the cortex to the periphery, I think in this line we must ultimately find the truth, and to-day we are nearer to it than ever before. The action of suggestions during the waking moments had been exemplified thoroughly by the experiments of Dr. Fillebrown. In the experience of physicians

there are many cases where the patients improve as soon as they see the doctor.

"I remember one very interesting case where the patient was hypnotized for the first time. Paralysis of the right arm was suggested with the complete loss of ability to recognize pain. This experiment was readily accomplished, and the patient passed from under observation for a week. At the expiration of this time a second hypnosis was secured, and interestingly enough, the right arm again passed into paralysis and loss of sensibility to pain without suggestion. This was repeated six or seven times at intervals varying from one to three weeks.

"Some remarks have been made regarding the number of cases in a hundred that are susceptible to hypnotism. As to this point, all statistics must, of course, depend upon their classification,—certain phenomena that Bernheim would consider an evidence of hypnotism or Charcot would ignore. I think the three divisions, lethargy, catalepsy, and somnambulism, are, perhaps, the most practical. If the patient is in one of these three states, that state I call hypnotism.

"In the United States the number of patients susceptible is not more than ten or fifteen per cent. My percentages are extremely low,—that may be because I am not a good hypnotizer,—but it is the result of observations upon fifty or seventy patients. Furthermore, results carried on in other countries have yielded better results. In France twenty or forty per cent. may be susceptible; and along with the French certainly must be classified the Spanish and Italian. I do not believe with Bernheim that ninety per cent., nor with Charcot that fifty-two per cent., of all individuals can be hypnotized.

"In reference to the mode of producing hypnotism (of which there are many), I have been rather fond of utilizing one that would separate me from the individual as far as possible. For four years I have used the revolving mirrors of Luys, which I take pleasure in showing you. It is composed of clock-work moving an upright spindle, to which is attached two strips of wood eight inches long and one inch wide, upon each side of which are placed six circular mirrors having a diameter of one inch. The bars revolve in opposite directions. The patient is instructed to look at the central portion steadily, and if susceptible, you will observe hypnotism, sleep, deep lethargy, somnambulism, within twenty minutes. This simply requires concentration of vision upon the revolving mirrors conformed with fixation of the mind upon the



idea of sleep. I became interested in this apparatus because of the separation of the operator from the patient, thus eliminating completely all possibility of the influence of the operator's will or of thought transference, and the results have been very satisfactory. I also show another apparatus used by the sportsmen of Germany, which is made of two bars revolving in opposite directions, and containing pieces of various-colored glass placed at different angles. It is placed in the bright sunlight in an open field, and birds are attracted to it by the regularly recurring flashes of light, so that they are easily captured. Luys constructed his apparatus from the instrument. It is well known that animals are hypnotizable, and numerous successful experiments have been made upon chickens, crabs, etc."

*Dr. Madison Taylor.*—I have been waiting to hear if a certain point referred to by the lecturer should be emphasized,—viz., the dangers of too indiscriminate use of these measures. I wish to urge that this point shall be strongly insisted upon in a discussion of this kind. The simple suggestiveness recommended here, the mere hinting to the individual to become anæsthetic, is a simple process readily demonstrable by many.

This, whether used by a properly-instructed operator or novice, may cause some possible mischief, if in no other way, by at least misunderstandings. This was brought out clearly by the lecturer, but not nearly enough in the discussion. It is often most tempting to induce a suggestive domination in a patient, but while securing this effect there may be too large a revelation of things that should remain hidden, which we have no right to discover.

Partial hypnosis offers many useful possibilities, and is frequently most useful, but entails grave responsibilities and some dangers not lightly to be ignored.

Dr. Newbold closed the discussion, reviewing the remarks of the speakers and thanking the audience for their attention.

Adjourned.

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## HARVARD ODONTOLOGICAL SOCIETY.

A MONTHLY meeting of the Harvard Odontological Society was held Thursday evening, September 28, 1893, at Young's Hotel, Boston, Dr. Eddy, president, in the chair.

*President Eddy.*—We have so often in our practice met with people who are anxious concerning the poor character of their teeth that we have felt the need of some system of feeding or

system of nourishing which we could prescribe to them for the purpose of improving the quality of their teeth, and thereby relieve all this anxiety. We are happy to-night in being honored with the presence of Professor R. W. Greenleaf, who will bring before us the subject of "Foods."

(For Professor Greenleaf's paper, see page 163.)

#### DISCUSSION.

Dr. Hitchcock stated that he had recently read an article describing the appearance of several cases of typhoid fever that could not at first be accounted for. After investigation it was found that the milk furnished by a certain milkman was responsible. He had been in the habit of washing his cans in water taken from a well which was near a deserted house. At some time previous there had been a case of typhoid fever in the house, and the water which came from the well was contaminated by the typhoid germs. He did not adulterate his milk, but simply washed his cans in the water, thereby producing a great number of cases of typhoid fever in Watertown and Nonantum.

I would like to ask Professor Greenleaf's opinion in regard to those foods which were put upon the market some time ago to be used by women during gestation, lactation, etc. They were made in a form similar to the chocolate caramel and were supposed to contain the phosphates, so that the bony structures would be well supplied during those periods. I have forgotten now who prepared them. My idea was that the bad results following the changes which the sugar underwent would offset the good received from the extra amount of phosphates taken.

*Professor Greenleaf.*—I am not prepared to say, not knowing to what food you refer; but it would be possible for changes in the sugar to counteract any good effect which might be hoped for from the phosphates.

*Dr. Hitchcock.*—What would be the effect on the child?

*Professor Greenleaf.*—As the child derives its nourishment from its mother, it is obvious that what affects the mother may affect the child.

*Dr. Werner.*—It has been my study for years how to counteract the evil tendencies that my profession brings to me, and it seems that some of these thoughts that the essayist has put before us in regard to our diet—particularly where he speaks of varying it, and of the bad effects of eating beef three times a day—are worthy of attention.

*Dr. Briggs.*—I would like to ask Professor Greenleaf whether, in the different amounts of the proteids and carbohydrates required, there should not be a difference in the maintenance of their relations in the man who gets a great deal of out-door exercise,—for example, the lumbermen, who are employed in cutting timber, and the army men that he has spoken of,—when compared with men of sedentary habits, like ourselves; in other words, if we do not need to have the line of the proteid substances approach nearer to the carbohydrates than they do?

*Professor Greenleaf.*—I think that is a very fair question, and it should be answered in the affirmative, as the processes of cooking affect somewhat the value of any article as food-substance. If meats are properly cooked, they go further in furnishing nutritive material. But the point is that the needs are for about that proportion of the different substances, and by the proper processes of cooking those amounts can be obtained from smaller quantities of foods.

*Dr. Briggs.*—I referred to the needs rather than to the processes of cooking. The question is, Should not the man who gets little or no exercise, and gets less oxygen than another man of the same age, take more of the proteids in proportion to the carbohydrates than a man whose occupation is out of doors, inasmuch as the oxygen he does get is appropriated by the carbohydrates, and the proteids are non-utilized? Is there not that danger to a man who takes little air and no exercise?

*Professor Greenleaf.*—It may be so to a certain extent; I cannot give you the exact data on that matter.

*Dr. Hitchcock.*—I would like to ask Professor Greenleaf how it is that savages can eat meat that is uncooked and sometimes perfectly putrid, while we are poisoned by ptomaines, whether our food is cooked or not? Is food more injurious when it is cooked?

*Professor Greenleaf.*—That is also a very difficult question to answer satisfactorily. To be able to eat food of the character you mention, one must suppose a stomach capable of digestion to an extent that we know nothing of, and their tolerance of poisons would naturally be so different from those of the people on whom the statistics were based that I do not think I can give you any information as to what would be injurious or what foods they would require.

*Dr. Hitchcock.*—But are not the ptomaines taken into the system just the same with the savage people as with civilized people?

*Professor Greenleaf.*—Possibly; but we do not know what may go on in the light of elimination. Where immense quantities of food are taken, and there are given digestive organs of unknown capacity, very likely the process of elimination goes on more rapidly than we have been calculating. The processes of elimination and powers of resistance are so different among the savages, and our knowledge of their dietaries is so limited, that we cannot say what would be injurious to them. But there is another feature to be taken into consideration. In the composition of some foods there are certain elements which, when they are developed, act as poisons to some persons,—in other words, some people have idiosyncrasies in regard to certain kinds of foods. Strawberries, which are regarded as so wholesome by the majority of people, are extremely poisonous to some, as are also shell-fish and various other kinds of fish. We do not know exactly what the form of poison is, but we do know that individuals differ in their susceptibility to the action of different kinds of foods.

*Dr. Briggs.*—As an illustration that the hardier classes cannot always endure everything, I will mention an epidemic that occurred in a lumber camp in Maine near where I go every summer. The majority of the men were stricken with typhoid fever, and it was found, after investigation, that they had drunk water from a running brook into which, some distance above, a wounded deer had fallen and decomposed. The peculiar feature of the case was that, as the excreta from the patients were properly destroyed, the fever still spread, and it was decided after the deer was found that the cause was due to the water running over that putrid meat. If we do not accept that theory, I suppose we would have to account for it in some way that the deer had the typhoid germ. Perhaps it was not a real typhoid. At all events, it goes to show that rugged men cannot stand drinking poisons any more than we can.

*Professor Greenleaf.*—The case Dr. Briggs speaks of is certainly a very curious one. The evidence is so strong that typhoid fever originates only from other typhoid cases that we do not feel justified in crediting it to any other source. The origin is oftentimes exceedingly obscure, and the question might be raised whether in this case the typhoid may not have been brought into the camp on clothing or in the milk-supplies, or other articles of food. And then it is possible this may have been a fever simulating typhoid. The difficulties of diagnosis may have led the physicians into the error of pronouncing it typhoid.

*Dr. Briggs.*—I do not know what the local physician knew about

the subject, but it was claimed that the origin of the epidemic was in the water which passed over the deer, and it is just as reasonable to say that the same disease could be caused by putrefactive changes in the camp itself.

*Professor Greenleaf.*—We do not recognize that as a cause either. We suppose that all cases of true typhoid must originate from the typhoid germ itself. There is, however, another thing to be considered in the case of an epidemic, and that is, secondary infection,—that is, a person will be nursing a patient, as might have been the case with the hunters we have just been discussing. Suppose, for instance, one of them had imbibed the typhoid germ in some way, and the others in nursing him and attending him were secondarily affected by the handling of articles soiled by the typhoid germs. The number of ways in which secondary infection can result are very numerous,—cutting bread, for instance, handling articles of soiled clothing and bed linen, using the same spoons and vessels from which medicine has been given without their being properly disinfected. This secondary infection is an element that probably accounts for a greater number of cases than the original infection by drinking water and the like.

*Dr. Giblin.*—I would like to ask Professor Greenleaf a question which was suggested to my mind by the frequent occurrence of typhoid fever in people returning to the city from vacations in the country, and it would be a valuable thing to know what precautionary measures should be taken in regard to food, etc., if it were thought there was likely to be any danger from typhoid. Dr. Grant tells me he has heard of several cases of friends who have returned from Chicago and had an attack of typhoid fever. I think it would be a great service to our friends if we knew some precautionary measures which we could recommend to them.

*Professor Greenleaf.*—That opens up a very extended subject. I do not know that I am right in taking up so much of your time, for I know you have another paper to discuss this evening, but the answer to the question the gentleman asks is particularly fitting just at present on account of the scare we have recently had from the threatened invasion of cholera. Now, that disease—cholera—is understood to be one in which, among other things, an inflammation of the intestinal mucous membrane is produced by a certain germ; those germs give rise to ptomaines which are toxic, and thus, when these germs are taken in either by drinking water or a like way, they at once set up an irritation in the intestines and produce the various symptoms which are known as cholera. That is the theory

of the disease. Now, if we keep that clearly in mind, and also the fact that the typhoid germ is in a general way very similar in its action to cholera, only slower, we can see what precautionary measures are necessary to prevent such diseases.

The cholera epidemic, which raged in Hamburg and other parts of Europe (and some idea of its extent can be gained when I say that in Russia alone were one hundred and ninety-nine thousand cases), is still fresh in our minds. In Hamburg it started in with great virulence, attacking some three or four thousand persons, and a noticeable feature of this epidemic was that the German soldiers, who were in the midst of the infection in Hamburg, escaped cholera. It was also noticed that the town of Altona, though but a short distance from Hamburg, practically a part of it, escaped with very few cases. Berlin also, though not many miles from the scene of the epidemic, with its million and a half of people, had comparatively few cases, only thirty-two. Now, the immunity of the inhabitants of Altona and of Berlin was chiefly by virtue of their water-supply, which had been purified by proper filtration, and the immunity of the garrison at Hamburg was due to their very carefully avoiding the polluted Elbe water, which was practically unfiltered at Hamburg, and by their drinking water from an artesian well instead.

If we think of such places as our people visit in the summer, you can see how easy it is for them to become infected with typhoid. Some one will be ill with typhoid, and in caring for that person no attention whatever may have been paid to the disinfection of the excreta. It is the most important thing in taking care of such a person to have the discharges absolutely disinfected, but, as I say, attention is not always paid to it. We also know that in many instances in country places, excreta are deposited within a very short distance of the water-supply, and it is a very easy matter for wells near at hand to be contaminated, and the germs be thus taken in through the water. A few years ago in Nahant, where no typhoid had existed for years, some seventy cases arose in a few weeks' time. The history of those cases was traced to two or three imported ones whose discharges were not disinfected, hence the water-supply was contaminated, and all the other cases arose from them.

Now, if our families have been living near a house where there has been a case of typhoid fever, they may imbibe the germs in the same way, but it does not follow that every case of typhoid fever will spread a contagion, as many times where these precautions are

not taken certain people escape the infection, which may be due to their respective conditions of health, which gives them immunity from the disease, or that the germ itself has in some way been destroyed. We cannot tell how persons escape the disease in such cases, but we do know that, given the danger of an exposure to a certain disease, results have proved the necessity of adopting all precautionary measures against it.

In Chicago the sewage material empties into Lake Michigan, and but a comparatively short distance from where the water-supply is obtained. Until recently there have practically been no provisions for the disinfection of this material. There is now in operation a system by which every particle that goes through the World's Fair grounds is disinfected; the solid portions are taken out, compressed, and burned, and the liquid waste containing disease-germs is thoroughly disinfected with chemicals, so that whatever sewage enters the lake at that point now is thoroughly purified. It will be a great advance to have all sewage similarly disinfected before it can enter a water-supply.

We were shocked when we heard of the great number of deaths from cholera that took place in Hamburg last year; but it is a fact not generally known, that the number of cases of typhoid in Chicago, Lowell, and Lawrence last year exceeded the proportion, when compared with the existing population, of the number of cases of cholera in Hamburg during the epidemic. You may set this down as a rule: that wherever you have a large number of cases diffused in a certain place, it is generally safe to say that the public water-supply is a possible source; where there are but a few isolated cases, the origin may be looked for in an infected milk-supply or other possible source less widely operating. If there is any reason to suspect that the source of a number of cases is in the water, the safest thing to do is to go without water, but in a great majority of instances that is a needless deprivation. A better way is to drink no water that has not been recently boiled if its purity is not above suspicion.

HENRY L. UPHAM, D.M.D.,  
*Editor Harvard Odontological Society.*

## Editorial.

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### ANOTHER ADVANCE IS NECESSARY.

It was with many misgivings as to the results when, in 1884, at the request of the dean of the Baltimore College of Dental Surgery, four men met together in Philadelphia, representatives of as many colleges, to consult in regard to the condition of dental education in this country, and whether it were feasible by concerted action to make any improvements in the unsatisfactory state which then existed.

The status of dental education at that period was about as bad as it could possibly be. The large majority of the schools were acting under a nominal two years, with courses of from four to five months. The so-called rule of "five years' practice," admitting students to the senior year who could present evidence of having had five years' practical experience, was in full force in the large majority of colleges. The results that had followed the adoption of this rule had become a professional scandal, as it was a notorious fact that a very large proportion thus admitted never had had the practice required.

Each of the schools was a law unto itself, and naturally resisted any invasion of the privileges accorded by the State charters under which they all operated, and any effort looking towards a change for the better seemed hopeless.

It is not surprising, then, that the self-appointed consultants looked gloomily at the present condition of professional training, and could not anticipate any great gain from the effort proposed. Would any considerable number of the colleges join in such a movement was the question uppermost in their minds. It was worth a trial, and the result of that conference was the issuing of the now historical call for a "meeting of Faculties (or their representatives) of all the dental colleges in the United States at the Sturtevant House, New York City, Monday, August 4, 1884, for the purpose of adopting a uniform standard of graduation, etc."

This meeting took place, and it was not only gratifying, but promised well for the proposed conference, that eleven colleges and departments of universities were represented.

No precedents existed for such an organization, and when the



representatives met, it was felt that if it were possible to effect a permanent association the laws governing it must be based on experience. Legislation in advance of this was not deemed practicable, and hence resulted one of the simplest constitutions, perhaps, ever adopted by an organized body.

The wisdom of this arrangement has been made clearly apparent by the lapse of time, but in this conference they builded "better than they knew."

It was very evident from the earnestness manifested at this meeting that the representatives present, who, with one exception, took part in the permanent association, were prepared for positive measures looking towards reform. It was, therefore, not surprising that the first resolution adopted became the basis of a series of working rules for the government of this body. This was apparently a very simple one, but meant very much at that period. It was that "after the close of the session 1884-85 students in dental colleges shall be required to attend two full regular courses of lectures in separate years." The adoption of this under then existing circumstances was a bold move, but its very boldness insured its immediate acceptance by nearly all the colleges then outside of the association. It was clearly evident that this organization meant to work up to a higher standard, and that all schools failing to follow must necessarily have the stigma of imperfection fastened upon them.

From this period the National Association of Dental Faculties became a power in the dental educational world, and when, subsequently, the National Association of Boards of Examiners was established, the results became more pronounced and the anxiety of outside colleges to fall in line with this work more decided.

Nearly ten years have passed since the time of that first meeting. Not one of the original number could have foreseen the remarkable results that followed that effort.

The scandalous rule of "five years' practice" was at once abolished. A strict surveillance of the actions of the various schools composing the membership was adopted, to be executed by an appropriate committee, and, while it may be possible that the rules are occasionally violated, it is gratifying to feel that this must be very exceptional.

The next serious move was the establishment of three years of study and attendance at the schools, together with a course of not less than five months to be taken in separate years. This, while not satisfactory to those departments having from seven to nine months, it was the best attainable at the time.

When it is remembered that the larger number of medical schools at that period had courses not over two years, it is not surprising that the weaker dental colleges at first objected to this extension, and it required several years of argument and persuasion before a decision could be reached. In the mean time many of the medical colleges had advanced the time. This, together with the fact that pressure was brought to bear by the profession at large through conventions and boards of examiners, led to its final adoption in 1889, to take effect in 1891-92.

The result of this move, after now nearly three years of trial, has been more satisfactory than the most sanguine could have predicted. While there has been a slight falling off in students in the first and second years, the aggregate has increased, and from a financial point of view the schools are better off to-day than at any former period. This is so marked that it ought to demonstrate to the most pessimistic that any further reasonable advance in the standard will not only prove of lasting benefit to colleges and students, but will increase the stability of the institutions.

There are three important advances yet to be made, and we approach the consideration of these with some hesitation. Not but that they are all necessary and in the line of progress, but it may be a question whether, in the case of two, the time has yet come for their adoption. Progress made by forced marches is not always the best, changes should be approached carefully and with due consideration of all the interests involved.

We will, therefore, first consider the one that seems to us feasible and worthy of immediate adoption.

As far back as 1889 an effort was made to have a resolution passed lengthening the course of each college to at least seven months. This was at that time laid upon the table, as it was not regarded advisable to add too much to the then anticipated three years' course.

This change to three years has demonstrated fully its own value, but there still remains a lack of uniformity in colleges and renders it impossible for the eight and nine months departments to accept those of five. Aside from this, perhaps a minor point, the one term of five months is too much in the line of past mistakes. While it is nominally five months, it really means not more than three and a half, for it must be evident that the first two weeks in October must be given to organizing in all well-conducted colleges, and that the last month is altogether broken up by examinations. This makes but ten and a half months of actual work for the three

years. It may be argued that the spring term lengthens this, but it is notorious that this is not obligatory, and but few avail themselves of its manifold advantages.

The time has certainly come when a change can be made in this, and it can be accomplished without injury to any school the present year. It is certainly to be hoped that the National Association of Dental Faculties will at the meeting in August, *extend all the courses to at least seven months.*

The other two changes are first in the preliminary examinations. It is questionable whether the profession are ready to advance this beyond what is regarded as a good English education, and we are not sure that it would be advisable at the present time, but it is an additional reform that must come. We can have no sympathy with the methods adopted in England and on the Continent in this respect, and do not believe that the high standard there required can ever be adopted in this country as far as dentistry is concerned. In order to meet its demands a young man's best years are sacrificed to the attainment of information which, while in itself of great value, is utterly useless in a practical profession such as ours must ever remain. The change, if any be made, must be made to a slightly higher standard.

The colleges should look forward to the final and, perhaps, the last great advance, the extension to four courses of eight months each in separate years. This accomplished, it is believed dentistry will be founded on a rock, and must from that time rear a superstructure in which all the parts will advance steadily to something approaching perfection. If this be attained, the work of the National Association of Dental Faculties will have been mainly accomplished.

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#### NO MORE NEED APPLY.

THE General Medical Council of Great Britain has settled the matter for those who commenced their course of study at Harvard and Michigan Universities previously to the passage of the law rejecting all American diplomas.

This is unquestionably the only consistent course, although it bears severely on the young men who had honestly endeavored to fulfil the requirements of the law. It is very evident that the editor of the journal of the British Dental Association voices the sentiment of English dentists when he plaintively says, "To us the applications prove how urgent was the necessity for a change in

the administration of this portion of the Dentists' Act." He evidently anticipated a mob of young American dentists, and was ready to give thanks that the deluge had been averted.

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## Bibliography.

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THE DENTAL COSMOS CALENDAR, published by the S. S. White Dental Manufacturing Company.

This excellent arrangement presented to the subscribers of the *Dental Cosmos* is admirably arranged for appointments, but it is also excellent as a daily memorandum for outside engagements. The publishers request suggestions for the betterment of this calendar from dentists. It seems, however, to comprise all that is needed for the objects intended.

PEARSON'S DENTISTS' APPOINTMENT-BOOK, published by R. J. Pearson & Co., Kansas City, Mo.

This is a very neat and convenient pocket appointment-book, and would be entirely satisfactory if the publishers would add the date of the month to the days of the week.

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## Obituary.

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### DR. SAMUEL J. DICKEY.

DIED, on January 4, 1894, after a short illness, Dr. Samuel J. Dickey, aged seventy-four.

Dr. Dickey followed his professional duties from his early manhood, and consequently was one of the oldest in the practice of dentistry in Philadelphia.

He always had a deep interest in professional labor, but preferred, apparently, the quieter methods, as he took but a limited part in dental society work.

He was prominent in the Masonic Order and active as one of the managers of the Masonic Home, one of the valuable benevolent institutions of Philadelphia.

Dr. Dickey's genial nature gave him a large circle of friends and insured the respect of all with whom he was brought in contact.

He was buried with Masonic honors January 8, 1894.

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## Domestic Correspondence.

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### PULP NODULES.

TO THE EDITOR:

BELLEFONTE, PA.

I have read with much interest Dr. Kirk's paper on "The Lime Formations in the Pulp-Chamber," as I have had several cases of the kind within the past few months.

All of the patients were strong men, Finlanders, working in one of our lime-quarries. The first one, aged thirty-five, complained of pain in the lower left first molar upon occlusion; tapping with an instrument or heat failed to give any response, but pressure with finger or biting upon a piece of wedging-rubber caused pain. The tooth was perfectly free from caries.

Upon extraction, the pulp was found ossified from the apex to the pulp-chamber, including the fibre connecting the inferior dental branch. This had the character of minute needles, which could be forced upon the inferior dental nerve by pressure upon the ossified pulp in the tooth.

The next case was also a Finlander, aged thirty-five. The tooth, the right superior first molar. This gave no response to tapping or heat, but biting on rubber or pressure produced neuralgic pain. This tooth was also free from caries.

Upon extraction, the pulp-chamber was found filled with nodules. The pulp-canal of the longer of the buccal roots was free from these deposits.

My experience in this direction, while limited, has been confined to patients who have lived on the coarsest kind of food and have done the hardest character of work.

Yours truly,

CHARLES E. RHONE, D.D.S.

[We acknowledge the reception of the specimens described. It is rare to find such complete calcification of the pulp.—ED.]

## Notes and Comments.<sup>1</sup>

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**PRESENCE OF MIND IN APPLYING ANTIDOTES.**—An instance demonstrating the value of presence of mind in emergencies occurred recently in Sag Harbor, N. Y., a report of which may be found in the *Scientific American*.

The little daughter of Dr. Sterling while playing about the house found a bottle which had formally contained citrate of magnesia, and still bore that label. The child took a large swallow. With a scream she dropped the bottle and began to clutch her throat in an agony of pain. Her father, who had heard her screams, found that what the little one had taken for citrate of magnesia was oxalic acid. Seeing that not a moment was to be lost, if he wished to save the child's life, the doctor looked about for an alkaline antidote. Seizing his penknife he sprang to the white-washed wall and scraped some of the lime into his hand. This he threw into a glass partly filled with water, and poured the mixture down the child's throat. The antidote took effect at once. The intense pain caused by the burning acid was alleviated, and soothing, mucilaginous drinks to cool the blistered mouth and throat did the rest.

This expediency has been previously recommended by us when writing upon the subject of emergencies.<sup>2</sup>

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**OVERWORK.**—A few possibly die early from overwork, says a well-known writer, but many more pass away from want of enough. Active, brainy men who have not abused their bodily system by excesses are among the longest livers. Gladstone, the English Premier, who is passionately fond of gardening and forestry as a relaxation, and who has been a wonderful worker, is now in his eighty-third year. Also in his eighty-third year is Professor Babington, the professor of botany in Cambridge, England, author of

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<sup>1</sup> The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1508 Arch Street, Philadelphia.

<sup>2</sup> See chapter on "Emergencies," composed of dental pathology and dental medicine, published by P. Blakiston, Son & Co., Philadelphia.

one of the best works on the British flora, and a tremendous worker. Another heavy worker is the great American geologist, Professor Hall, of Albany, N. Y., who, though over eighty, was working as actively as a young man at a recent meeting at Rochester. We could fill pages with similar instances, illustrating the fact that hard work does not necessarily mean short life. At any rate, it has always been our opinion that it was much better for us to wear out than to rust out.

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**PROFESSIONAL ETIQUETTE.**—We have read with interest in the December issue of the *Dental Review* an editorial by Dr. Johnson upon professional etiquette. He writes particularly of one phase of this subject which we do not remember having seen discussed, but which is of sufficient importance to merit the pages devoted to it. This pertains to the courtesy due a dentist who calls on a brother practitioner during his office-hours, and conversely to the consideration due the practitioner from the caller. It is filled with suggestions that would be valuable to nearly every young practitioner, and to some of the older ones.

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**COLLEGE ADVERTISING.**—It is announced that one of the many Chicago dental colleges has shown so great a lack of self-respect as to have the following advertisement placed upon the back of a menu in a cheap restaurant: "Go to the operating-parlor of the ——— College of Dental Surgery, on floor above; your teeth will receive careful and proper attention at a very moderate cost."

This must have given our foreign friends a singular idea of the college ethics prevailing in that city. When a college that is represented in the National Association of Dental College Faculties shows no more regard for professional interest, we think this Association should take some decided action along these lines.

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**SELF-TEACHING.**—By education is meant the training of the head and heart to the highest attainable degree of perfection and usefulness. A question that is often forced upon the thoughtful mind in this relation is, Can one overcome temperament? Whenever this experiment has been earnestly and thoughtfully tried, it is admitted that inherited traits can be modified, if not entirely overcome. A recent writer in *The Outlook* says, "Temper, disagreeable voice or gesture, an ungraceful walk, a tendency to untruthfulness, lack of confidence, all traits that weaken or mar character,

are being constantly effaced by those who recognize inherited burdens. If this were not so, what would we mean by development of character?

"Temperament may be defined as a constitutional organization, or mental and physical traits, depending primarily upon heredity. Now, to reach the highest human perfection—which endeavor is a duty incumbent upon every one—we must study our own, our whole nature; work to overcome every weakness; leave our failures always behind us, and strive to develop, broaden, and elevate our own intelligence. Remember that the estimate of a man, and relatively that of the profession he represents, is usually measured by the breadth of intellect he displays in his intercourse with the world."

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INFALLIBILITY.—Dr. Welch, in writing editorially in the *Items of Interest*, says truly that it will not do to ever appear too self-confident and infallible. Such an action appears too much like a mask put on to hide weakness and incapacity; neither will it do to express frequent doubts and fears. To distrust one's self is to court the distrust of one's patients. A prompt, manly, straightforward course is quite sufficient to show we know what we are about; that will win confidence, though all men know all men to be fallible. Yet, where results are necessarily in doubt, we should show hesitancy and express our honest conviction. "Why did you not tell me I might have trouble?" from a returning patient, is always embarrassing.

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AN OBTUNDENT FOR SENSITIVE DENTINE.—As a satisfactory "obtundent" for sensitive dentine is very desirable, I send you herein a formula which has responded more frequently in desired results than any other combination I have used, not excepting my experiments with the secret nostrums sold for the purpose. While this in preparation cost less than one-fourth of those, I have the satisfaction of knowing the constituents, and would advise those who desire an obtundent for this purpose to try this combination before purchasing any secret product.

R Cocaine, grs. v;  
Carbolic acid, grs. xx;  
Chloroform, ʒss;  
Muriatic acid, ℥x;  
Alcohol, ʒii.

C. N. PEIRCE.



## Current News.

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### THE GENERAL MEDICAL COUNCIL OF GREAT BRITAIN.

"THE Committee considered applications from the following persons, who hold American dental qualifications recognized by the Council prior to May 29, 1893, and who urge that they should be allowed to be registered on the ground of having commenced their course of study for their diplomas in several cases long previously, in the belief that they would constitute registrable qualifications, and received no sufficient notice to the contrary.

"George William Field, D.M.D., University of Harvard; Edward M. Quinby, D.M.D., University of Harvard; G. Rufus Gray, D.M.D., University of Harvard; L. N. Seymour, D.D.S., University of Michigan; B. C. Hinkley, D.D.S., University of Michigan; E. V. Hinkley, D.D.S., University of Michigan; E. G. Snodgrass, D.D.S., University of Michigan.

"*Resolved*, That these gentlemen be informed that they cannot be admitted to registration unless they can prove that they had passed through a curriculum equivalent to that demanded by the Medical Council from the licensing bodies of the United Kingdom."

[The remarks upon this by the editor of *The Journal of the British Dental Association* indicates very clearly the temper of the dental profession in England.—Ed.]

"The refusal of the Council to accede to the request of seven gentlemen who had obtained American dental qualifications recognized by the Council prior to May, 1893, and who urged that they should be allowed to be registered, on the ground of having commenced their courses of study for these diplomas previously to that date, in the belief that they would prove registrable qualifications 'unless they can prove that they had passed through a curriculum equivalent to that demanded by the Medical Council from the licensing bodies of the United Kingdom,' shows that the Council is in earnest with regard to its decision of May last upon this question, and is not prepared to go back upon it. *To us the applications prove how urgent was the necessity for a change in the administration of this portion of the Dentists' Act.*" (Italics ours.)

## NEW JERSEY STATE DENTAL SOCIETY.

*Committees for 1894.*

*Accommodations.*—Dr. Charles A. Meeker, Dr. C. W. F. Holbrook.

*Programmes.*—Dr. Charles A. Meeker.

*Clinics.*—Dr. R. M. Sanger, Chairman; Dr. O. Adelberg, Dr. A. R. Eaton.

*Exhibits.*—Dr. C. W. F. Holbrook, Chairman; Dr. Harvey Iredell, Dr. B. F. Luckey.

*Essays.*—Dr. S. C. G. Watkins, Chairman; Dr. C. S. Stockton, Dr. J. Allen Osmun.

*Clinical Conference.*—Dr. Harvey Iredell, Chairman; Dr. Wm. E. Truex, Dr. J. W. Curtis, Dr. Thomas Moore, Dr. I. M. Vandewater.

*Dental Literature.*—Dr. A. R. Eaton, Chairman; Dr. George E. Adams, Dr. W. Woolsey.

*Mechanical Appliances.*—Dr. Wm. P. Richards, Chairman; Dr. Henry A. Hull, Dr. F. W. Kitchell.

*Materia Medica.*—Dr. Charles A. Meeker, Chairman; Dr. G. Carleton Brown, Dr. G. E. Adams.

*Prosthetic Dentistry.*—Dr. F. C. Barlow, Chairman; Dr. H. B. Van Dorn, Dr. P. J. Wilson, Dr. J. L. Crater.

*Transportation.*—Dr. George C. Brown.

*Press.*—Dr. F. C. Barlow.

*Inspection in the Public Schools, etc.*—Dr. Wm. L. Fish, Chairman; Dr. W. E. Linstead, Dr. F. L. Hindle, Dr. A. A. Schubert.

*Legislative Committee.*—Dr. Charles A. Meeker; Dr. F. C. Barlow; Dr. James C. Clarke; Dr. George C. Brown; Dr. R. H. Sheppard; Dr. A. R. Eaton. (Chairman to be elected).

*Entertainment Committee.*—Dr. B. F. Luckey, Chairman; Dr. Wm. L. Fish, Dr. F. E. Riley, Dr. O. Adelberg, Dr. Wm. E. Truex, Dr. George E. Adams, Dr. Wm. E. Linstead.

The chairmen of the respective committees will at once communicate with the several members of their committees and arrange for the work to be performed. The Secretary will make a call for results May 26. Meetings of the several committees can be called for the afternoons of February 19 and April 16, from 2 to 6 o'clock. The use of rooms on the third floor of S. & J. Davis's, No. 943 Broad Street, has been tendered the committees.

## OHIO STATE DENTAL SOCIETY.

At the last annual meeting of the Ohio State Dental Society, held December, 1893, the following officers were elected for the ensuing year, 1894:

President, Chas. Welch, Wilmington; First Vice-President, W. H. Todd, Columbus; Second Vice-President, Henry Barnes, Cleveland; Secretary, L. P. Bethel, Kent; Assistant Secretary, L. E. Custer, Dayton; Treasurer, C. I. Keely, Hamilton.

L. P. BETHEL,  
*Secretary.*

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## WOMAN'S DENTAL ASSOCIATION OF THE UNITED STATES.

THE regular monthly meeting of the Woman's Dental Association was held February 3, 1894, at 1308 Walnut Street, Philadelphia, the President, Dr. Mary H. Stilwell, in the chair.

In the absence of the essayist, Dr. Alice I. Ireland, her paper was read by the Corresponding Secretary, Dr. Annie T. Focht; subject of paper, "Food: Its Relation to the Teeth."

Next meeting will be held March 3, 1894, at 1300 Arch Street, Philadelphia. It will be the yearly business meeting.

ELIZA YERKES,  
*Recording Secretary.*

4004 CHESTNUT STREET, PHILADELPHIA.

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## ST. LOUIS DENTAL SOCIETY.

THE St. Louis Dental Society will hold its annual clinics on March 20, 21, and 22, 1894.

Reduced railroad rates. A cordial invitation is extended to all members of the profession.

For further particulars, address,

JOHN G. HARPER, *Corresponding Secretary*,  
803 Pine Street, St Louis, Mo.

## INTERNATIONAL MEDICAL CONGRESS.

THE Eleventh International Medical Congress will be held at Rome, Italy, March 29 to April 5, 1894.

The sections number nineteen. Odontology being number thirteen on the list.

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## ILLINOIS STATE DENTAL SOCIETY.

THE Thirtieth Annual Meeting of the Illinois State Dental Society will be held in the Senate Chamber, Springfield, Ill., May 8, 9, 10, and 11, 1894. An interesting programme is in the course of preparation. Practitioners of Illinois and of adjoining States are cordially invited to attend.

LOUIS OTTOFF,  
*Secretary.*

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## RECENT PATENTS.

A LIST of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL:

509,901.—Extensible Dental-Engine Bracket. Horace Hobbs, Milwaukee, Wis., assignor of one-half to Augustus W. Friese, same place. Filed August 22, 1892.

510,048.—Electrical Apparatus for Operating Dental Implements. Oscar H. Pieper, San José, Cal. Filed November 25, 1892.

510,325.—Device for Measuring Tooth-Roots. Asher I. F. Buxbaum, Cincinnati, Ohio. Filed February 17, 1893.

510,484.—Dental Engine. Leroy S. Pfouts, Canton, Ohio. Filed January 13, 1893.

510,856.—Brake for Dental Engines. Peter V. Guerry, Philadelphia, Pa. Filed June 30, 1893.

510,963.—Dentists' Device for Saving Gold Fillings. Alonzo J. Douds and Frank F. Douds, Canton, Ohio. Filed January 31, 1893.

511,029.—Dental Hand-Piece. Christopher M. Spencer, Windsor, Conn. Filed September 27, 1893.

511,067.—Dental Forceps. Harry Walter, Philadelphia, Pa., assignor to George W. Teufel, same place. Filed March 23, 1893.

511,619.—Teeth-Separator. James W. Ivory, Philadelphia, Pa. Filed May 11, 1891.

## Selections.

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### CREOSOTAL.

THIS is the name which Professor Brisonnet, of the School of Medicine, Tours, gives to the body obtained by combination of carbonic acid and creosote (*Répert. de Pharm.*). The product is likely to be of considerable therapeutic value, for it is a neutral, bland, sweet, oily liquid, without odor, non-irritating to the mucous membrane, and is readily borne by the stomach. It is made by acting upon sodium-creosote with chloro-carbonic acid,  $\text{COCl}_2$ , in alkaline solution. The creosotal separates and sinks to the bottom of the mixture. It is collected, washed with a weak cold solution of alkali, and any adhering water is driven off by a gentle heat. The specific gravity of the purified creosotal is 1.165; it is insoluble in water, glycerin, and dilute alcohol, but soluble in all proportions of strong alcohol, ether, chloroform, and benzin. A hundred parts of it are equal to ninety of creosote, yet it has been given in doses of ten, fifteen, and twenty grammes a day without disturbing digestion. In the intestines it is resolved into its components, creosote and carbonic acid, and creosote is found in the urine half an hour after a dose has been taken. Its use is indicated in tuberculosis and other diseases for which creosote is prescribed.—*Chemist and Druggist*, February 18, 1893.

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### THE ANTIDOTE FOR ARSENIC.

DR. SQUIBB recommends the following as a simple method of preparing hydrated oxide of iron, the antidote for arsenic, one of its chief advantages being that the ingredients are always easily obtained: Take of tinctura ferri chloridi, four ounces; aqua fortis, four ounces; mix in a vessel of twelve ounces capacity, and add aqua ammoniæ, one drachm. Shake well, pour it on a large wet muslin drainer, wring out the water and alcohol, and wash with fresh water. The stomach having been evacuated by emetics while the antidote was being prepared, give four fluidounces at once, to be followed by an emetic. Then give two ounces every ten minutes.—*N. Y. Med. Times*.

## THIOCAMF.

THIS name was given by Professor Emerson Reynolds to a liquid devised by him as a disinfectant, and described in a paper read by him at a meeting of the Royal Dublin Society four years ago. It is made by bringing sulphur-dioxide gas into contact with camphor and dissolving in the resulting liquid various antiseptics, among them phellandrene and benzoic acid. This liquid can be kept in bottles without pressure, but on exposing it to the air in a thin layer it gives off "relatively enormous volumes" of sulphur-dioxide gas. Reflecting upon this property possessed by the liquid, Dr. George F. Duffey conceived the idea of using it as an intestinal antiseptic. He gives an account of his use of thiocamf as a remedy in the May number of the *Dublin Journal of Medical Science*.

As regards the external use of thiocamf, Dr. Duffey's experience includes two cases of scabies. One was very severe and complicated with extensive eczema. A four-per-cent. solution of the drug in olive oil was applied, and the patient was cured in fourteen days. In the other case, in which there was but little eczema, a cure was effected in five days. From the effects of the pharmacopœial solution of sulphurous acid in parasitic skin-diseases he thinks that an oily solution of thiocamf would probably be of use in pityriasis versicolor, favus, and other dermatophytic affections. In the case of a paralyzed woman who had a large bedsore of the sacral and gluteal regions, gangrenous and emitting a most offensive odor, applications of an oily solution—four-per-cent. at first, then six-per-cent.—"quickly removed the fetor, diminished the discharge, and caused the sore, after the removal of the slough, to assume a clean, healthy appearance." A four-per-cent. solution came to be largely used in the out-patient service of the City of Dublin Hospital, in which institution Dr. Duffey's trials of thiocamf were made, for dressing ulcers and wounds, and was found very efficient in keeping the parts free from fetor and in checking the discharge. The application of such a solution to a raw surface causes a slight and evanescent sensation of heat and prickling; if a stimulating effect is required, the strength of the solution may be increased.—*N. Y. Med. Journ.*

# THE International Dental Journal.

VOL. XV.

APRIL, 1894.

No. 4.

## Original Communications.<sup>1</sup>

### SCALLOP WIRE MECHANISMS FOR REGULATING TEETH.

BY J. N. FARRAR, M.D., D.D.S., NEW YORK CITY.

(Continued from page 148.)

IN the March number of this journal was published several *retaining* mechanisms of the scallop wire class that I have found to be of great value in safely *holding teeth in place* after having been regulated. In this paper will be presented several other mechanisms of the same class. These mechanisms, however, are for *correcting irregularities* of the teeth. By these, either a pushing or a pulling force can be caused, but their greater value lies in the pushing qualities. The force may be derived from elastic wire, but the best results are from wire that has little or no elasticity. In these the wire has but few curves; generally two or three, the remainder being plain. The pushing force of the wire is increased by opening wider the curves with broad round-beak pincers, or by an effort to partly straighten the wire. The drawing force is increased by pinching the curves closer.

For anchors to these scallop wires, cribs made after the old plans of Delabarre, Schange, Lachaise, or that which is called the

<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

Atkinson form are practicable. These, which are represented by Figs. 7 to 12 (inclusive), are, however, not as firm as clamp-bands, which may be used with or without plates. For moving only two or three teeth I prefer to use them without. Only such skeleton mechanisms will be explained in this paper.

Fig. 13 represents a small mechanism for moving an instanding upper central incisor forward. It consists of a clamp-band for anchor, a stiff piece of (pushing) wire, W, and a ferrule, having a loose socket. One extremity of the wire W, bent zigzag, is soldered to the anterior part of the lingual side of the clamp-band; the other (being free) is fitted to the socket linked to the ferrule, cemented on the tooth.

The proper point of bearing on the tooth to be moved depends upon the direction and motion desired. If the tooth is to be moved directly outward, the bearing should be against the middle part of the lingual side of the tooth, but if the tooth is to be turned, the bearing should be to one side of the middle.

To increase the pressure on the tooth, the zigzag curves in the wire are slightly opened, as if in an attempt to straighten them.

Fig. 14 represents a similar mechanism for turning a left upper or a right lower cuspid. This one differs from the last one represented, in that it draws upon the tooth, instead of pushing upon it. The pulling wire is situated on the buccal side of the arch. To increase the force, the curves are pinched closer.

Fig. 15 represents a mechanism for moving forward instanding upper or lower centrals. This consists of two bicuspid gum-guard ferrules, A, A (for anchors), a wire bow, W, and two ferrules, F, F. The extremities of the bow are bent zigzag, and the ends are soldered firmly to the lingual sides of the ferrules.

To apply the mechanism, the anterior part of the bow is first placed against the lingual sides of the instanding centrals, and then the gum-guard ferrules are forced on the second bicuspids. To hold the bow in place, it is lodged in open rings soldered to the gum-edge of the lingual sides of the ferrules. These ferrules are cemented on the incisors with phosphate of zinc.

Fig. 16 represents a similar mechanism for moving forward four instanding upper or lower incisors. The difference between this and the last one described lies mainly in the anchors. Instead of gum-guard ferrules being used, these are the author's (slight) modifications of the Delabarre and Schange cribs. My improvement in the crib is confined to uniting the anterior ends of the round side wires by *very thin gold ribbons* of rolled wire. These will easily

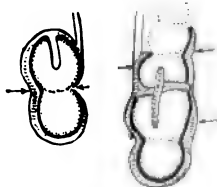


FIG. 7.



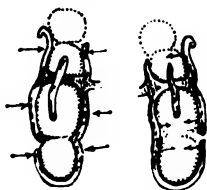
Delabarre's crib (1826).<sup>1</sup>

FIG. 8.



Schange's crib (1848).<sup>1</sup>

FIG. 9.



Lachaise's crib (1848).<sup>1</sup>

FIG. 10.



Author's modification.

FIG. 11.

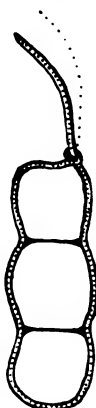
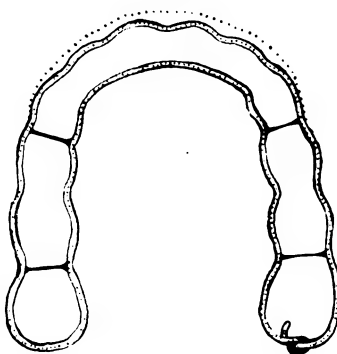


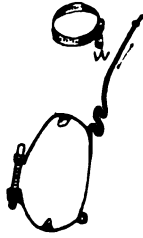
FIG. 12.



"Atkinson cribs" (1877-79).<sup>1</sup>

<sup>1</sup> These are the dates when these cribs were first made public.

FIG. 13.



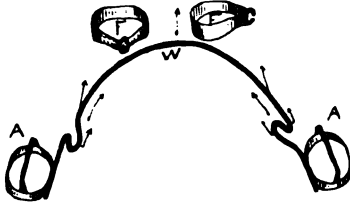
Mechanism for pushing force (A).<sup>1</sup>

FIG. 14.



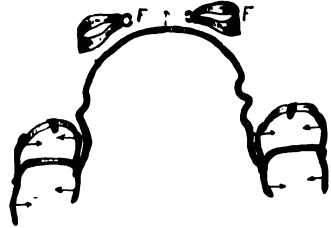
Mechanism for pulling force (A).

FIG. 15.



Mechanism for pushing instanding incisors forward (A).

FIG. 16.



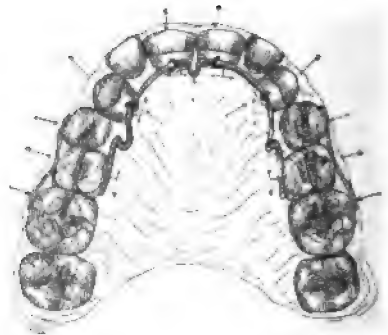
Mechanism for moving forward four centrals (A).

FIG. 17.



Mechanism for widening the cuspid parts of the arch (A).

FIG. 18.



Enlarging the upper arch (A).

<sup>1</sup> The letter (A) indicates mechanisms devised by the author.

slide between the teeth, so as to bear squarely against the anterior approximal sides of the anterior teeth within the cribs, and prevent them (cribs) from being forced posteriorly when the bow is applied behind the incisors. This bow, like that last described, is held against the centrals by ferrules, F, F, having open rings. The force is increased by partly straightening the curves in the wire.

Fig. 17 represents a similarly made mechanism for widening the cuspid part of the upper, or the lower arch. It consists of two clamp-bands, for anchors, a wire bow, and two ferrules having open rings. Like the other mechanisms, the force upon these teeth is increased by straightening, so to speak, the zigzag part of the bow. This bow is also held in place on the cuspids by the ferrules (cemented).

Fig. 18 represents an operation for enlarging the anterior part of the upper arch. The wire bow was held in place by plain ferrules (having open rings) cemented on the centrals and cuspids, and by gum-guard anchor ferrules (not cemented) on the second bicuspid. To increase the forward force against the six front teeth, the posterior parts of the zigzag wire were partly straightened. The lateral force upon the side teeth was increased partly by straightening the curve in the middle of the bow, and partly by the elastic wires on the buccal sides of the anchor-bands. All these various directions of force upon the teeth are indicated by arrows.

This mechanism requires skill to properly form the wire, and properly apply it, but when it is so formed and applied, its actions are very satisfactory. No bunglers can properly make or use successfully this or any of the other mechanisms herein represented.

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## ALLOYS AS NOSTRUMS AND AS SUBJECTS FOR INVESTIGATION.<sup>1</sup>

BY DR. J. MORGAN HOWE, NEW YORK.

ALL will probably admit the truth of a statement that there is no reason why dentists should be ignorant of the ingredients of the materials that they use for filling teeth, as well as for the medicinal and mechanical procedures that are practised by us. We might even assert that those who work without knowledge of the constituents of their materials are not worthy to be called professional

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<sup>1</sup> Read before the New York Odontological Society, January 10, 1894.

men; but then we would probably remember that the application would come so close to us as to be uncomfortable, and we would not say quite so much aloud. But in the use of alloys and cements, that are almost all of them proprietary and secret preparations, are we not certainly chargeable with being lacking in professional spirit as well as with preventing progress? We claim to be progressive, but leave the measure and direction of progress in the hands of the manufacturer; and not only in his hands, but in his head do we leave the making of our compounds for filling, so that we are ignorant of what should be added or subtracted to produce the qualities we desire.

Alloys and cements for filling are, as we use them to-day, nostrums. The makers of these wares, almost all of them, consider it to their interest to keep dentists in ignorance of their composition, but it is clearly not for *our* advantage to continue to acquiesce in this condition of affairs. Each manufacturer, like all nostrum venders, claims superior virtues for "our make," and we take and use the material thus furnished without making any claim to decide for ourselves what we desire to use.

The subject of secret preparations and their use is not a new topic in dental society meetings, but such compounds as are more used than any others have seemed to be strangely exempt from the special consideration they deserve.

In referring to the expressed opinion of our *confrères*, I cannot do better than to quote from an admirable paper by Dr. Kirk, on "The Question of Local Anæsthetic Nostrums," read before the First District Society of New York in March last. Referring to nostrums in general, he says,—

"With respect to the use of nostrums, the Code of Ethics of the American Dental Association, in Article II., Section 3, under head of 'Maintaining Professional Character,' says, 'It is unprofessional to circulate or recommend nostrums, or to perform any other similar acts,' which means that the moral sense of the better element in dentistry is against the use of these preparations. In his annual address, in 1892, the president of the Pennsylvania State Dental Society, Dr. Louis Jack, at its Cresson meeting, expressed his views upon the subject as follows: 'If we are professional at all, it is entirely inconsistent with the pretension that any one should secure control of procedures or the use of appliances for his own exclusive benefit, and unworthy of those who are under the moral obligation to fulfil the maxim, "Freely as ye have received, freely give." The endeavor to impose upon the profession by dispensing,

for gain, secret formulæ of any of the preparations or materials we use is a still more reprehensible practice, and the use of such should be excluded from any and every society. To effectually stamp out this evil there appears only one means of action, which is for each practitioner to refuse to use any preparation the ingredient and the proportions of which are unknown to him."

During the ensuing discussion of the address, Dr. J. Allen Osmun said, "There is no discovery or improvement in the practice of dentistry that would benefit the profession or their patients that the dentist who possesses it is not under bounden obligation to give to the profession. He owes it to them."

Under the title, "The Right and the Wrong of it," the Philadelphia *Medical News*, December 24, 1892, quotes the following from the *American Lancet*: "The *Practitioners' Monthly* says, 'It is not wrong to use a proprietary medicine because the Code says so, or because some men think so. It is wrong because it damages both medicine and pharmacy. It is wrong because it retards progress, sacrifices the good of the mass for the profit of the individual.'"

It seems strange, indeed, that, such being the convictions of representative men, and of very many others, we have continued so long using materials for filling, the ingredients of which we are ignorant of, applying professional sentiments mostly to preparations least used. Manufacturers offer their wares, making their claims of all the desirable virtues, and we accept without knowledge of the composition of the material, using and commending, perhaps, but unable to tell what ingredients and what proportions produce the qualities we approve of. Various efforts have been made to interest dentists in the composition of alloys, but without very much effect.

In 1874, Dr. S. P. Cutler presented a number of interesting facts about the amalgamation of several metals and their characteristics, and a posthumous paper on amalgam, by the late Professor T. B. Hitchcock, gave the result of much study and observation on his part and that of others. During more recent years two manufacturers (W. M. Speakman, of Philadelphia, and the Kellar Dental Company, of Indiana) have made alloys of which they have published the formulæ, but, so far as I am aware, they have not attracted much attention.

Dr. J. O. Kellar, of the Kellar Dental Company, analyzed sixty-five different popular alloys, designated by as many names, and published the formulæ in a circular advertising the non-secret preparations of the company. I am not aware of the degree of success attending the effort to introduce alloys and cements of known com-

position, but the analyses referred to received a certain endorsement by being embodied in the article on "Metallurgy" in the "American System of Dentistry." This list of analyses is an interesting subject for study, and, taken together with the prices of the alloys, is a serious commentary on the judgment of manufacturers regarding the ignorance or indifference of dentists as to the commercial value of the materials they use in practice. All these sixty-five claimants for favor must be pushed and advertised, and of course the dentist must pay for the latter expense as well as for the material and labor entering into the composition of the material itself. Many of them are mere duplicates of each other, differing only in their fanciful names. It seems to me that this Society could not take a more worthy or progressive step at the present time than to provide for the expense of a series of systematic experiments by a competent chemist and physicist, to determine with some definiteness what properties are conferred on alloys by the various metals used, and to decide upon some two or more formulæ that shall seem to fulfil our requirements in the greatest degree, and also to decide with more fulness questions that I have touched upon in some experiments I shall make report upon. Such a movement would be a beginning in the direction of learning to prescribe what ingredients and qualities we want. We could soon begin to use alloys with a better understanding of what the different compounds would accomplish.

There are six metals that may be said to have been commonly used in compounding alloys, as shown by the analyses referred to, —namely, tin, silver, gold, platinum, copper, and zinc. Only one maker of alloys (Dr. Chase) has used antimony, and the use of cadmium has probably been for very good reasons discontinued. Aluminum has been very little used as yet as a constituent of our alloys, but its properties in this regard ought to be investigated. Dr. Flagg has given a great deal of information regarding alloys in his book, but there are questions which he has not settled, and much that we might yet learn.

Last June, Dr. Crouse sent me samples of two alloys which he proposed to have made to sell to members of the Dental Protective Association, and I have been interested in them for that reason, and also because one of them contained aluminum. I had never used an alloy containing this metal, and it seemed to have peculiar properties, besides that which was claimed for it, that it would not discolor or tarnish in the mouth. I am unable to make any report on this latter quality, but the color and working qualities of the alloy

have seemed to me very favorable, and have commended themselves to me thus far. Early last spring, Professor Mayr made some alloy for me from a formula I sent to him. In the letter from him, he expressed the opinion that coarse-cut alloy was better than fine, in requiring less mercury and in shrinking less. My preference had always been for fine-cut alloy, and as I thought probably the opinion was the result of theorizing, my mind was not very much impressed by it; but the professor expressed somewhat the same opinion when he addressed this Society last June. He said at that time, speaking of alloys for amalgam, "The coarser the grain, the less mercury is taken up; the more slowly the process of hardening, but the harder the amalgam, the less likelihood of shrinking. The finer the grain, the more rapidly it hardens, takes up more mercury, and is less likely to expand than to shrink. This matter of fineness of grain seems to me of more importance than even slight variations in the composition." The 1888 circular of the Kellar Dental Company contains a statement that coarse-grained alloys are best; that amalgam made from such particles will work stiffer in the hand, but will have less tendency to shrink because of quicker setting. They therefore advised the use of coarse-grained alloy. Nevertheless, the advertisement of this company in the January number of the *INTERNATIONAL DENTAL JOURNAL* says that Kellar's alloys are cut into microscopical shavings, so that they manipulate with a velvety feeling in the hands, and that the demand for amalgams with a fine plasticity is almost universal. "Hence we send the microscopic shavings instead of the coarse powder, unless otherwise ordered."

We cannot blame them for sending what is popular when we don't take the trouble to find out for ourselves what is best, and so order it.

In Dr. T. B. Hitchcock's paper above referred to, he said, "An amalgam hardens quicker when the filings or cuttings of the alloy are moderately coarse than when they are fine."

Here are contradictory statements from three parties, each of whom may be credited with considerable information in regard to alloys, but neither of them states that the opinion expressed is the result of experiment, and there is no reference to the amount of mercury to be used. A fair inference would be that the expressions regarding the relative qualities of fine- and coarse-cut alloys is meant to apply to them when mixed with the same weights of mercury. I have made a few experiments, the results of which are interesting, and also very valuable, I think.

First, I will show some bottles containing fine and coarse parti-

cles of alloys, which I was able to obtain by sifting the different alloys; some are very fine grains and some are quite coarse. But both fine and coarse of the same kind represent the two extremes out of the same lot, as furnished by the maker. The medium cuttings—constituting the greater part of the alloys as prepared—were not used for testing-purposes. I weighed a given equal number of grains of alloy of coarse-cut and of fine-cut (say twelve grains), and a given equal number of grains of mercury (say six grains) for each portion of alloy, and on making the amalgamation I found that the mass made with coarse-cut alloy was considerably more plastic than the mix made with fine-cut. So that the statement of the Kellar circular, which states that amalgam made with coarse-cut alloy "will work stiffer in the hand," is contradicted as a generalization by my experiment. The same relative result was obtained with three different alloys, showing the coarser-cut particles to make a much more plastic mass than the fine-cut, with the same relative quantity of mercury. I made other amalgamations in the same way, with a progressively diminishing amount of mercury, until the mass made with fine-cut alloy was so powdery as to be almost unworkable, while that made with the coarse-cut was less powdery and more easily worked. In regard to the rapidity of hardening, I made with the same alloy two amalgamations, taking equal weights of coarse- and fine-cut metal, with the same relative weights of mercury. These were packed in short sections of glass tubing, and five minutes afterwards pushed out, so that their progressive hardening could be observed; and the fine-cut was found to set much quicker than the other. Being tested five minutes, ten minutes, an hour, an hour and a half, and two hours after, it was found still to be considerably harder, but four and five hours after packing the conditions seemed to be changed, and the coarse-cut mix was rather the hardest. This was repeated with three different alloys, and with practically the same results.

Finally, taking equal weights of coarse- and fine-cut alloy, I took an amount of mercury for the fine cuttings just sufficient to make a workable mass, and for the coarse cuttings of the same alloy I used one-third (thirty-three and one-third per cent.) less mercury. Making amalgamations under these conditions, the amount of plasticity of the two mixes was so nearly equal that no difference could be perceived. The coarse-cut mix was quite as workable, with one-third less mercury, as the fine-cut mix with the larger quantity. These masses were packed in short sections of glass tubing, and afterwards pushed out for observation. Repeated testing showed no



perceptible difference in rapidity or degree of hardness between the two samples of the same alloy until two or more hours after mixing, when the plug made from coarse particles seemed to be gaining in hardness over the other. These tests were also made under the same conditions with three different alloys. The formulæ of the alloys used differ considerably, so that it seems quite probable that these results will apply to all our alloys. One formula is stated by the maker as, silver, 56; tin, 40; gold 4. Another, Dr. Crouse has stated to be (approximately), silver, 42; tin, 50; copper, 5; aluminum, 1; zinc, 1; gold, 1; and the third, made by Professor Mayr, is, silver, 52; tin, 40; copper, 3; gold, 5.

These facts are presented with a hope that we may in some way begin investigations that shall increase our knowledge of our compound filling-materials.

In regard to alloys, I think we ought to go even further than suggested by Dr. Jack, "to refuse to use any preparation the ingredients and the proportions of which are unknown to him," but we ought to refuse to use them unless the formula is published by being printed on the package.

By buying only of those who are willing to do this, a reform of this kind could easily be brought about.

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### PYORRHŒA ALVEOLARIS.<sup>1</sup>

BY C. N. PEIRCE, D.D.S., PHILADELPHIA.

In response to your request that I shall give you some thoughts upon "pyorrhœa alveolaris" for the monthly meeting of your District Dental Society, to be held on the 26th, in Buffalo, New York, I may say that it must be short, though I will try and make it to the point.

In writing, thinking, or speaking of the subject, "pyorrhœa alveolaris," the matter of first importance is to have it closely, definitely defined; without this limitation, there is no certainty that any two are dealing with the same pathological condition. Observation and interpretation, then, must enter largely into an intelligent comprehension of the subject, and in its discussion it must be borne in mind that we have different abnormal states, which are liable to be

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<sup>1</sup> Read before the Eighth District Dental Society, Buffalo, N. Y., February 26, 1894.

spoken of as having a common origin, because of the similarity in results, this necessarily leading to antagonisms and embarrassment. Calcic pericementitis may have its origin at the gingival borders, the tartar acting as a local and mechanical irritant with the train of concomitant evils, such as irritation, inflammation, formation of pus, and absorption of gum and alveolar process. This may be treated locally, and be reported as a case of pyorrhœa cured, when the most that can be said of it is that it was the result of a local cause, and has been treated and cured by topical applications. Now, to avoid such complications in diagnosis, let us first recognize the fact that we have three distinct abnormal conditions affecting the gums, pericemental or alveolo-cemental membrane, and alveolar process. The first is gum inflammation and destruction caused by a mechanical irritant,—the salivary calculus of which we have just spoken. Second, inflammation of the gingival borders without the presence of tartar,—Dr. Black's phagedenic gingivitis and pericementitis. The third is a pericemental irritation commencing at or near the apical extremity of the root, due to the presence of some morbid composite of the blood, exuded with the plasma and infiltrating the alveolo-cemental membrane and frequently deposited or precipitated upon the root of the tooth near its apex. This latter I designated true pyorrhœa alveolaris or hæmatogenic pericementitis; and so intimately is it associated with some other local manifestation of a gouty diathesis that I have believed, and do now believe, it to be but another local expression of *that* systemic condition. This assumption has been confirmed by the fact that the accumulation which is so frequently found upon the roots of teeth near their apical extremity, by careful chemical analysis, has been proved to be composed of sodic urate, calcic urate, free uric-acid crystals, with some calcic phosphate and carbonate. Nor is this the only evidence of the correctness of this theory; cases which had been treated for months and indeed years without more than modifying the progress of the disease have, when the patient has been subjected to rigid constitutional treatment such as restriction in meat diet to simple albuminous food, with such remedies administered as are usually beneficial in gout or a uric-acid diathesis, responded promptly, the inflammatory state with its concomitants, pus formation and process absorption, has been arrested, and, if not too far progressed towards dislodgement, the teeth have become comparatively firm and free from pain.

I might in a few condensed propositions give conclusions which appear to me to be fully warranted:

1. The inflammatory stage of true pyorrhœa alveolaris primarily begins in tissues on the side of the root near the apical extremity, and, *secondarily*, advances towards the gingival borders.

2. The cause of this inflammation or pericementitis is the plasma exudation from the blood-vessels, freighted with salts, which, in their deposition and crystallization upon the cementum of the root, exert the influence of foreign bodies and react as irritants.

3. The salts in question as disclosed by chemical analysis, are calcium and sodium urates, free uric acid, and traces of calcium phosphate.

4. The chemical nature of these salts indicates a condition of the blood in which there is an excess of uratic salts and uric acid, due to either increased formation or imperfect elimination. The excess of these salts general pathologists regard as indicative of a faulty nutrition and the immediate cause of a series of local disturbances to which the term gouty has been applied, the nutritional disturbance being known as the uric-acid diathesis.

5. Results from constitutional, in connection with the usual local treatment in a number of well-authenticated cases of pyorrhœa have been so markedly satisfactory that the writer feels fully justified in his assumptions regarding the origin of the disease.

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## PYORRHŒA ALVEOLARIS—THE OTHER VIEW OF IT.<sup>1</sup>

BY GEORGE S. ALLAN, D.D.S., NEW YORK.

MR. CHAIRMAN AND MEMBERS OF THE ODONTOLOGICAL SOCIETY,—My excuse for being with you this evening seems to be twofold, —first, it was a pleasure to accept your kind invitation, and, secondly, I thought I had something to say worthy of your attention; but as to this last, the more I think over what has been said and written on my subject, the more doubtful I feel as to the wisdom of my coming. It is true I have some definite and settled views as to both the cause and the proper treatment of the so-called disease, pyorrhœa alveolaris, but I doubt much now whether I can impress you with the conviction that they are either new or specially valuable. But this I can say: They seem good to me. They help and guide me in my daily work, and I am convinced they look towards

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<sup>1</sup> Read before the Odontological Society of Pennsylvania, February 10, 1894.

the truth. Then, in addition, my good friend Peirce has, in a measure, stirred up my combative disposition, and so I waive my scruples and misgivings, and bring you such food as I have for your mental repast this evening.

The hard and increasing work and study on pyorrhea alveolaris is most encouraging, as to the results attained and to be attained in the treatment of this most troublesome disease. It is but a short time ago that the average practitioner wholly declined to even attempt its treatment, and advised his suffering patient to either have the offending member extracted at once or to suffer in silence, for he knew no means of alleviating the pain, much less of saving the tooth. The disease was akin to old age, and, like old age, was not amenable to treatment, and was equally hopeless. The *vis inertiae* of utter ignorance as to the causation of the disease was too great to be easily overcome, and few dentists cared to waste either time or effort in the way of treatment. This happily is not now the case, and most of us are glad to be able to offer our patients some hope in the way of temporary, if not complete, salvation, and almost always are able to alleviate pain and discomfort.

Teeth are lost in one of two ways,—either through a destruction of their substance by decay or of their foundation; that is to say, they loosen in their sockets and fall out, or become so troublesome that they must be taken out. With caries, so-called decay of the teeth, we have nothing to do to-night.

The physical aspects or conditions found where the foundations of the teeth are destroyed vary very much, but for our purpose it is not necessary to enter into a close analysis or comparison of them. Leaving out of question what may well be called a senile loosening and consequent loss of the organs,—that which is solely a result of old age, where the gums and alveolar process disappear, waste away by absorption, exposing more and more, as time passes, the root, until at last the socket disappears, and the tooth is simply thrown off for want of support, a condition well understood and as hopeless for treatment as the age of the patient itself,—we have a variety of other conditions looking towards the same result if neglected, but which offer a fair field for investigation, study, and treatment, with the promise of more or less hopeful ending.

The day is past when the educated dentist can dismiss a patient with the statement that his disease is hopeless and that he will have to lose his teeth one by one as time goes on. For our purposes it would be a waste of time to go into any detail of the symptoms and conditions which mark the inception, progress, and

ending of this disease, my object being only to draw attention to one or two special points. First let me say there is only one generic term I know of that will apply to all cases, the appropriateness of which cannot be questioned. The term is "luxation of the teeth." If to this generic term the two specific ones, pathogenic and traumatic, be added, we have a nomenclature that will fit all cases and conditions that present themselves. For it is true the presence of tartar in any of its varying forms is not essential to the disease, and the same can be said of pus. That, too, is often found wanting. An inflammatory condition in either the acute or subacute form may or may not be present, but the work of destruction goes on just the same. Necrosis of the processes is only an adjunct at times, and so we can go through the list. And it is not so rare a thing to find a case in which tartar, pus, inflammation and necrosis are all wanting, at least to all ocular evidence, and the disease still be present and progressive in its nature. In our present state of knowledge, it would be difficult to make strong assertions as to the rôle that germs play as a causative agent or agents. They, alas, seem to be omnipresent; but the amount of influence they exert for evil we have no present means of determining with exactness. One or more of the conditions named may be present, and some are much more common than others. They each and all are important or unimportant as the case may be. The fault we find with the classifications of Drs. Black and Peirce is that they do not recognize this fact.

Dr. Peirce's terms are but modifications of Dr. Black's, and by the introduction of the word "calcic" he recognizes the presence of tartar as the essential factor, the vice *par excellence*, to be sought for and eradicated, in combating the trouble. Dr. Black's terms, "serumic" and "phagedenic," go further, in that they recognize other factors besides the blood-serum and saliva as the sources of the active agents we seek for,—the power behind the throne. It appears to me very necessary that we should bear all these facts in mind if we want to be able to correctly diagnose and treat pathogenic or traumatic luxation of the teeth.

There may be said to be two camps of theorists in reference to this somewhat vexed question,—those who hold to the belief of its constitutional nature and those who refer it to a local exciting cause, and each side is quite sure it is right. A bias or preconceived opinion in any direction is hard to overcome. We are all more or less the slaves of our prejudices and opinions. There is a German school which takes the ground that all the diseases of the teeth are

due to some constitutional vice, and as a consequence frown upon all local treatment, and take their pills, powders, and liquid medicines philosophically and in good faith. Now, I am one of those whose faith in the constitutional vice theory is very limited, and I feel quite certain that for all practical purposes the disease has a local origin, and that effective treatment must be based on this belief.

Therefore I look upon the paper which our able and scholarly colleague Dr. Peirce lately read before the New York Odontological Society as calculated to mislead and befog us, rather than to clear our vision and help us in a practical way. And yet no one of you more highly appreciates the great value of that paper, or more readily acknowledges the sincerity of purpose which pervades it, than myself. I confess also that I offer my criticisms upon it with many doubts and misgivings as to my ability to carry you with me.

First let me say that after hearing the paper read, and then carefully reading it in the January *INTERNATIONAL DENTAL JOURNAL*, I find but one new thought in it; or rather I should say, there is in it one old thought with a new prop or support to it. Briefly stated, it amounts to this: *pyorrhœa alveolaris* is a constitutional disease, and indicates a gouty diathesis, because a chemical examination of the deposits on the teeth shows the presence of free uric acid. The learned doctor, I think, has given us too broad a generalization from a limited amount of support. To properly and rightly present my arguments and conclusions, I quote from the printed paper.

"Specimen No. 1 contained, as shown by microscopical analysis, a number of fine needle-crystals of calcium urate, a few crystals of free uric acid, and crystals of calcium phosphate. Destructive distillation analysis yielded a strong ammonia reaction. The murexide test for uric acid and its compounds was faint, though the characteristic color showed in several places.

"Specimen No. 2 presented the same crystals on microscopical investigation. The murexide test was strong, producing a number of purplish-red spots.

"Specimen No. 3 yielded similar results.

"In addition to these three analyses by Professor Congdon, some six or eight specimens were examined by my friend and colleague Professor A. P. Brubaker, M.D., D.D.S., in my library and in my presence, the results obtained corresponding to those of Professor Congdon. In three of these an abundance of urate of soda crystals were observed. It must be remembered that, as the quantity embraced in each specimen was small in amount, large results could scarcely be obtained or expected."

Puzzling my mind over these analyses, those obtained by Dr. Peirce and those found in the books, the thought came into my mind that an independent one might help; so I interviewed my friend Professor Ricketts, of Columbia College, and obtained his assistance. Two samples, as his report shows, were given him. The one marked No. 1 was composed wholly of the black or serumic tartar from the roots of a number of teeth. The other, marked No. 2, was from the teeth of a patient having a strongly marked gouty and rheumatic condition of the system, partly an inheritance, partly acquired. The former was placed in the professor's hands, together with the published paper of Professor Peirce, with the request that he would make an analysis for comparison with those given by Dr. Peirce. The latter material was sent him just as it came from the teeth, with the request that he make a test for the presence of uric acid. Of course, this latter was not pure. It was mixed with the usual *débris* found in such positions and a large amount of salivary tartar. Still, there was a fair proportion of the black tartar present. With the above explanation, I now give you Professor Ricketts's report.

"CERTIFICATE OF ANALYSIS.

"NEW YORK, February 5, 1894.

"DEAR SIR,—The sample of tartar from teeth from —, marked 'No. 1,' submitted for analysis, contains: Total solids, 63.80 per cent.; total organic matter, 36.20 per cent. The organic matter contains trace of uric acid."

"CERTIFICATE OF ANALYSIS.

"NEW YORK, February 5, 1894.

"DEAR SIR,—The sample of powder from —, marked 'No. 2,' submitted for analysis, contains: Uric acid, none.

"Yours respectfully,

"RICKETTS & BANKS.

"TO DR. GEO. S. ALLAN,

"51 West Thirty-seventh Street, New York."

These analyses prove, granting that they are accurate and contain no errors as to facts or conclusions, that a trace, and trace only, of free uric acid may be found at times in the black or serumic tartar commonly found clinging to the necks and roots of teeth in ordinary cases of pyorrhœa alveolaris. Dr. Peirce, I believe, claims more, but I question whether he can rightly do so.

The analysis (Dr. Peirce's) was qualitative only, and qualitative in respect to one constituent only. Now, at various times there have been quantitative analyses made of this same black deposit, and in no one of them do I find any reference made to the presence of uric acid. This fact alone would go to show that uric acid cannot enter largely into the composition of black tartar, for if it did it would certainly have been detected at an earlier date by some one of these chemists. Dr. Ricketts's was quantitative in part, so I take it for granted that we have to deal with a very small amount of uric acid,—so small that it would not seem to be safe or prudent to build so comprehensive a theory upon it, to the practical neglect of the other ingredients that go to make up the bulk of the deposit.

Again, free uric acid in the system does not necessarily prove a person to be either gouty or rheumatic. It is undoubtedly a symptom, and a strong one, but not a conclusive one. Free uric acid is frequently found in the blood-serum of persons who have neither a rheumatic nor a gouty tendency, and in these cases rather points to a condition of the system where destructive metabolism is in the ascendancy. Waste is going on more rapidly than repair. Overwork, nervous or physical exhaustion are, as a rule, associated with this uric-acid condition of the system,—so much so that it is considered one of the most positive diagnostic symptoms of a run-down or enfeebled condition. A changed condition of life—one of rest, recreation, and enjoyment, followed by a building up of the system—will be followed almost immediately by the disappearance of the excess of waste products, including the uric acid and urates.

As further proof of the correctness of this position, I quote from an article in the *American Journal of the Medical Sciences* for February, 1891.

"V. Jaksh has examined the blood of patients in the effort to determine,—

"1. Whether uric acid took part in the acid intoxication occurring in febrile conditions.

"2. Whether it took part in the production of gout or attacks of gout.

"He refers to the statements which have already been made in support of this view, but says that investigations in the matter have never been carried out on a large number of patients.

"In all, he examined the blood of one hundred and five cases in a manner described by him. In nine cases of healthy individuals no uric acid was found. In nervous diseases it was also absent,



and the same was true of nine cases of typhoid fever. In another case of this disease and in one of intermittent fever there was no uric acid present during the elevation of temperature, though it was detected after fever had disappeared.

"In the instances of diseases of the liver, stomach, and intestines examined, uric-acidæmia was only observed where anæmia was also present.

"The acid was found in diseases of the heart which produced cyanosis, as also in emphysema and pleural exudates. It was constantly present in considerable quantity in the febrile stage of five cases of pneumonia. In six cases of acute articular rheumatism there was no uric-acidæmia observed.

"Very considerable quantities of uric acid were found in all the cases of diseases of the kidneys, and in those of primary and secondary anæmias. These observations seem undoubtedly to prove that uric-acidæmia is not a pathognomonic symptom of gout."

Again, in "The System of Medicine," Pepper, article by Dr. W. H. Draper on gout, you will find this strong assertion:

"But apart from these physiological objections to the theory that uric acid is necessarily the offending substance in gout, it is well known that uric-acid salts accumulate in the blood in febrile diseases, in disorders of digestion, and in anæmia,—notably in splenic anæmia,—and do not produce either the symptoms or lesions of gout."

If Dr. Peirce is right, the presence or non-presence of pyorrhœa alveolaris would be a strong diagnostic symptom or the contrary of the gouty condition. But this is not the case; at least, physicians do not so consider it. In fact, there seems to be no recognizable connection between the two. For years I have been in the habit of asking patients coming for treatment if they were either gouty or rheumatic, and the answers, grouped together, have had only a negative value. I have been exceedingly anxious to find some constitutional vice that would bear the brunt of the trouble; and as it was in the air, as one might say, that gout and rheumatism were the suspected causes, I have seldom, if ever, neglected an opportunity of obtaining reliable working data to help in forming a correct diagnosis. I am sorry to have to report no satisfactory conclusions. A strong objection to the whole theory lies in the fact that, whereas depositions of tartar are so common as to be almost a rule in middle life and old age, I am thankful to say gout and rheumatism do not bear an undue proportion to the other ailments humanity labors with.

But let us, for the sake of argument, accept the conclusions the

learned author arrives at, and see where they land us. Gout and rheumatism, especially the former,—or, to state the case in another way, all manifestations of either disease,—are followed by deposits of lime salts in the joints or other positions, and are deemed to be the most intractable of all diseases to treat. The deposit once formed, refuses to be dislodged. It cannot be reached. The blood-serum can carry fresh supplies of the objectionable material, but it cannot, no matter how it may be changed in character, redissolve it, take it back into the system, and dispose of it through any of the ordinary excretory channels. The same may be said of urinary calculi; and the poor mortal who has once passed one of these latter, no larger than a small pea, has had most painful evidence of the truth of this statement.

Now let me ask you the question in this latter case, Is the uric-acid state of the system the cause of the inflammation, pain, and distress, or is it the little lime nodule that happens to be situated where it is decidedly not wanted? How formed or whence came that nodule has nothing to do with the train of distressing conditions that it produces. It is a cause sufficient unto itself for them all. The vice in the system did form the nodule, but there its evil work ceased, and the nodule takes up the work where the vice leaves it. And as to these results, neither physician nor patient cares whether this nodule is composed of calcium phosphates, carbonates, or urates. They only want to get rid of it, and they work and labor only with that object in view, and they both know that when that is attained peace, comfort, and health return.

Now, I hold that the chemical constitution of this deposit has nothing to do with the train of evil results that follow its formation, though Dr. Peirce strongly intimates and accepts a contrary opinion. This you will see from the following quotation: "The fact, however, that in true pyorrhœa the symptoms are so different, and that all local treatment has been practically so unavailing, has suggested the possibility that some other chemical agent derived from the blood, and the product of some morbid constitutional state, might be the exciting cause," and he bases his argument strongly upon this belief. Now, it is most certainly true that no constitutional treatment can cause the blood-serum to take this deposit—let its composition be what it may—back into its current and carry it away. Professor Peirce says, "It is for this reason that I regard the deposition of uric acid as of blood origin, and the disease pyorrhœa alveolaris as one of the local manifestations of the constitutional state familiar to all pathologists as the

uric-acid or gouty diathesis." If this statement were true, then the removal of the tartar and other local treatment would be unavailing, and a cure could not be effected, no matter how completely the parts were brought into a healthy condition. But this we know not to be the case. Cures are being constantly effected, though unaccompanied by constitutional treatment.

These reflections lead to one inevitable result. For all practical purposes, the constitutional-diathesis theory must be abandoned where treatment is to be adopted; and this I say fully impressed with the importance and value of the work done, and the facts brought to light as to the causation of the disease in what may be said to be the last analysis. Back of the local excitants and other factors of like nature that are the immediate cause of the disease, the wise man will seek means of prevention. But prevention and cure are two widely different things to think about, and call for as widely different means to attain the end sought for. Constitutional faults or vices do indeed lead to deposits of tartar, but when the tartar has been once deposited on the necks or roots of the teeth it starts in business on its own account, and on lines and in ways that its constitutional father never dreamt or thought of, and with results in the way of manufactured products that clearly indicate its ability to take care of itself. So by all means let the good work of the constitutional-diathesis theory workers be encouraged. The more they can do for us in the way of prevention the better; but we must not let them throw dust in our eyes, and lead us astray with the delusive hope that we can mend a broken head if we can only catch the boy who threw the stone and send him to the nearest Sunday-school.

It may be well to close with a few words in reference to treatment which appears to be most effective; and here let me say that, with many others, I hold that the present state of our knowledge does not permit of such a thing as a radical cure in any but a few exceptional cases, but I do most fully believe that much can be done, especially in the earlier stages of the disease, to ward off its evil effects, and even effect a permanent change for the better.

If my view be the correct one, these lesions and pathological conditions have their origin in some mechanical or chemical irritant obtaining a lodgement under the free margin of the gums, and to one holding this opinion it is not necessary either to underrate or deny the indirect influences that systemic cachexies have, either in aggravating or inviting them. Good judgment must be used in weighing the value and importance of each and all.

Looking at the condition of the teeth and adjacent soft tissues from a clinical stand-point, we find them much as follows:

1. As a rule, if the gingival borders have a healthy normal appearance and the teeth are not shaky, we may be assured that, though the disease has obtained a lodgement, it has attained no great headway.

2. Any departure from this condition shows progress in the disease, and that, too, just in proportion to the amount of the departure from the normal state. The thing to be done is to bring back the parts to the healthy condition, first, by removing the direct cause, and, secondly, by following the removal by local health-inducing treatment of the affected parts.

"Let it be recalled that in this form of the disease the morbid process begins at the root, and very frequently, if not usually, in the vicinity of the apical extremity."

This statement seems to be erroneous, and contrary to ordinary observed conditions. So far as my observation goes, the deposit is first formed just under the free margins of the gums, and in rare cases only at the apical ends of the roots, and I have yet to see a case where the so-called pocket did not point the way to reach it. Dr. Black, whose authority to speak is unquestioned, in the "American System of Dentistry," classifies pyorrhœa alveolaris, without question or exception, as a disease having its origin at the necks of the teeth; and if any other authority of note, excepting Dr. Peirce, does otherwise I do not know it. Kindly allow me time to use the black-board to illustrate my position, and I cannot do better than to make use of three marked cases that have come under my notice since deciding to come before you.

Now, a word as to how the deposit, where we have to deal with serumic tartar, is formed, and its nature. It is not easy to go back of the theory that the lime salts composing the deposit have been carried to the parts through the medium of the blood-serum, but it is no slight problem to indicate how it has been accomplished. Possibly the principle of diffusion may account for it, but it cannot be so stated positively. In the large majority of cases the deposit in the early stages will be found just under the free margin of the gums and above the periodontal membrane, and this would seem to show that it could not have been directly carried to the parts by the blood current. In some way the plasma, weighted with the salts, is exuded or pressed through the membranes, and attaches itself to the necks of the teeth. The formation of tartar deposits is a gradual one, and as it goes on it is brought more or less under

the influence of the saliva and other fluids in the mouth; to what extent these may modify or change its nature we can hardly guess. But the probabilities are that they do affect the characteristics, physical and chemical, of the deposit to a considerable degree, and there is little doubt that the *débris* of the mouth also forms a part of the deposit. Microscopical examinations indicate this very strongly. I am not in a position to question the judgment of Dr. Peirce where he says, "As the current of the lymph-stream is directed for the most part towards the cementum, through its borders or periphery into the lacunæ and canaliculi, and finally in the reverse direction, it is not difficult to see why the deposit should take place on the surface of the cementum as well as in the meshes of the alveolo-cemental membrane." But I confess I do not quite understand what Dr. Peirce means by his reference to the lymph-stream; but it seems to me that proof positive that it is so formed and deposited is wanting, other than it may be in a few exceptional cases. The deposit as found is amorphous; no crystals ever go to form any part of it, and it is not constant, so far as we know at present, either in its chemical or physical characteristics.

The ways of removing deposits on the teeth are at our command,—the mechanical and the chemical. As to the first, it is mostly a matter of skill, controlled by the educated eye and touch. Force to any amount is seldom required, and never to the extent of injuring the soft tissues or the alveolar processes. Dr. Van Woert, whose most excellent paper on this same subject may be found in the January, 1894, number of the *INTERNATIONAL DENTAL JOURNAL*, is wholly right in what he says on this point. The chemical agent I mostly rely upon is sulphuric acid, using a ten-per-cent. solution of the pure manufacture.

One point I would lay special stress upon, in closing, is the vital necessity where teeth have become loosened in their sockets in some way to give them support. The constant motion of a shaky tooth of itself rapidly destroys what foundation is left, and all work is useless that does not contemplate holding the teeth firmly in place as of the first importance.

## INTERESTING AND RARE CASE.

BY E. S. TALBOT, D.D.S., CHICAGO.

THE following interesting case is now under my care. It is so uncommon that I deem it of sufficient importance to not only place it on record, but to ask if any one has had a similar one, and also ask the cause. Mr. J. J. McG., a retired business-man, fifty-eight years of age, has lost all his bicusps and molars upon the upper jaw. For years he has been using the incisors and cuspids for cutting and chewing his food; the result of which is, the inferior teeth have worn away, exposing and destroying the pulps of the central incisors. I made and fitted a plate upon the upper jaw, bringing the jaws to their natural position, as a result of which quite a space exists between the upper and lower incisors. For the past two weeks I have been treating the roots of the inferior central incisors with the view to filling them. Now for the mystery. A sharp edge existed upon the posterior surface of the inferior incisors. This being removed, the two teeth with dead pulps became so sensitive where they were ground away that the least touch could scarcely be borne. The pain was precisely like that of any tooth with a live nerve ground down to the dentine. After repeated applications of nitrate of silver for two weeks the pain ceased.

No pulp being present, what produced the pain?

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SOME OBSERVATIONS UPON PYORRHOEA ALVEOLARIS.  
REVIEW OF PROFESSOR PEIRCE'S PAPER.<sup>1</sup>

BY R. OTTOLENGUI, M.D.S., NEW YORK.

I HAVE been requested to send you my opinions upon pyorrhœa alveolaris, viewed from the stand-point of an article by Professor C. N. Peirce, in the INTERNATIONAL DENTAL JOURNAL for January. In the same number of the JOURNAL I find an article upon the same subject by Dr. F. T. Van Woert, together with the discussion of his paper, and in the February number I find the discussion of Dr. Peirce's article. With your permission, therefore, I will take up the subject from the stand-point of the papers and discussion found in both numbers of the JOURNAL.

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<sup>1</sup> Read before the Eighth District Dental Society, Buffalo, N. Y., February 26, 1894.

It is no new idea that pyorrhœa is attributable to a systemic rather than to a local cause. More than ten years ago, Dr. William H. Atkinson, when treating these cases, prescribed constitutional remedies, cinchonidia being one of his dependencies. The new thought in the paper by Professor Peirce is that uric acid is a primary cause in the production of the worst form of this disease. To Dr. Peirce we must give full credit for his published work, and for the series of investigations and experiments that have led up to it. If I mention, therefore, that this idea is not a new one to me, it is not to lessen the force of what Professor Peirce has given us, but rather to show that what opinions I may express may have more value than if it were true that it has only been since a few weeks ago that I have given this matter thought.

I think it is fully five years ago since Dr. M. L. Rhein first told me that, in his opinion, there was a close relationship between the most aggravated (and, I may say, aggravating) form of this disease and the gouty diathesis. From that time I have been seeking closely for histories which connect this disease with the gouty complaints. I also know that during this time it has been a frequent habit of Dr. Rhein to have examinations of urine made where the disease was conspicuously present. I regret to say that I cannot give any results that he has deduced, nor would it be proper for me to anticipate what he has the right to publish as his own. But I would suggest that, as time enough will elapse after receiving this and before your meeting, Dr. Rhein be invited to give you his views upon this subject.

I will only mention, in relation to what I have observed myself, that, whilst I have no clinical facts to offer, it is true that, though I accepted Dr. Rhein's view as probably correct, I have been unable to verify the fact. I have questioned over three hundred persons afflicted with virulent pyorrhœal conditions, and the number who have admitted that they had suffered from any form of disease attributable to gouty diathesis was not at all commensurate with the number we would expect to find were this the true and only explanation. However, it is quite possible that even in those cases in which there was no known history of rheumatic tendency uric acid may have been the most important factor in causing the local disease symptoms about the teeth. What more I could say would be conjectural, and therefore unprofitable. I am inclined to view the theory as probable, but it is scarcely time for its free adoption. There is too great a tendency among dentists to adopt every new idea, and the result is that many so hastily accepted must event-

ually be discarded. I think that Professor Peirce is working in the right direction. He has the ability to pursue the subject to a satisfactory and conclusive end, but I believe that it will be wise to wait a while before announcing to our patients that at last we know all about it.

I would next like to say a word about terminology. *Pyorrhœa alveolaris* is a bad name. It is indefinite, and almost meaningless for the purpose to which it has been applied. But there is this in favor of it: it is already well known to a vast number of laymen. It is not at all uncommon for me to have new patients ask me to examine their mouths to see if they have *pyorrhœa*. They usually use the one word, which is significant. The public wants simple names for their diseases. Since there is no other part of the body which is afflicted with *pyorrhœa*, it is clear that the explanatory word *alveolaris* is unnecessary. Therefore I would favor the adoption of the name *pyorrhœa* as a designation for the class. Next, we recognize that there is more than one form of the disease, and I am not sure that there may not be more than two distinct forms, with different etiology. I do not favor the names proposed by Dr. Black, nor do I like those suggested by Professor Peirce, but I cannot offer any better. Perhaps it might do to call the worst form *serumal pyorrhœa* and the other *calcic*. But I do not really advocate this, because it is still to be decided what part the deposits play in the disease, there being no doubt in my mind that it may exist in its most discouraging form without deposits either from the blood or from the saliva.

From the realm of my experience, I will endeavor to describe some distinct forms of the disease, as I have seen them, together with concomitant peculiarities.

We frequently hear of men who effect radical cures of *pyorrhœa*. I doubt very much that these men have done so. I have listened over and over to their histories of such cases, and I have read reports that have been printed, but almost invariably I have been impressed by the thought that these men have been incompetent diagnosticians. To them, any ooze of pus from the pocket around the neck of a tooth is a true case. Why not? Is it not *pyorrhœa alveolaris*?—pus from the alveolus? But however poor they may be as diagnosticians, we cannot deny the honesty of their reports. Therefore we must recognize that there is a pus-generating disease, which is curable.

I should not include this in the class which I would denominate *pyorrhœa*, or if I did I think I should call it *gingival pyorrhœa*, for,



first, it is a disease confined strictly to the gingivæ, and, secondly, it is not caused by calcic deposits, though the deposits play an important part, as I shall describe.

Gingival pyorrhœa (to use the term as a temporary designation, for the purposes of this paper) is really a gingivitis which has been neglected until a suppurative stage is reached. This suppuration may result in two ways, or may be caused by both together. The first appearance is a localized, but well-marked inflammation, confined to the gingival pedicle which lies between the teeth. For a long period, it will extend no farther, and there will present a well-defined line, which appears to separate the inflamed from the normal tissue. This line will be just below one drawn across the highest point of the gingival arches. If the patient notices the disturbance at all, the report will be "My teeth bleed when I clean them." In this stage the disease is not difficult to control. Nightly applications of glycerole of tannin will accomplish much. In time the inflamed territory expands, and the disease spreads along the arch of the gingiva, until the whole of the margin of the gum is involved. Then the gums appear turgid and swelled. They are also rough, and loosely bind the teeth. A sort of pocket is formed and deposits are invited. These in turn add to the trouble, until we find them exerting an irritating influence, which ends in a purulent condition. Or, where deposits are not made, the gradual degeneration of the vitality of the part will result in pus. In these cases, pus may be abundant, but the pocket will not be deep, and the pericementum is not at all involved. Of this I am positive. When the pericementum is involved, then I would say that from gingival pyorrhœa we have supervening the condition which I have denominated salivary pyorrhœa. I do not mean that this second form always originates in a gingivitis, but where a gingivitis is present we have a fruitful soil for the grafting of the more dangerous malady.

The salivary pyorrhœa, then, is where salivary calculus is found about the necks of the teeth, with pockets extending up and encroaching upon the area originally occupied by the alveolar bone, and from these pockets we expect pus. This condition I would include among those possibly attributable to uric acid, though the next is more probably so.

Where the disease is solely serumal pyorrhœa, we would argue that salivary calculus was not necessarily present at the initiatory period. The deposit has been made at or near the foraminal end of the tooth, and the subsequent pocket has been formed by the bur-

rowing of the pus which has accumulated as a result of irritation. I am inclined to believe that in these cases the serumal deposit is not a mere incident of the disease, but that it is the primary lesion. If not, then we must imagine that the disease exists first; that we have pus accumulating at the end of the tooth and burrowing its way outward until a pocket has been formed, and that the deposits occur afterwards. Now, who can truthfully report such a condition? We have seen pus discharges where no deposits exist, but who can assert that deposits of one kind or the other have not existed prior to the examination made by himself? Personally I have never noted such a condition, except where, instead of a well-defined pocket, there has been rather a well-marked separation of the soft tissues from the tooth itself, with a dissolution of the bone; and invariably I have observed that the pockets do not reach the end of the root, except in the final stages, when extraction becomes almost an immediate necessity.

The serumal pyorrhœa, then, in my opinion, begins when the deposit is made at the end of the root.

But next we have complex conditions. The serumal pyorrhœa may become engrafted upon the salivary. That is, the saliva may deposit calculi first, and in an advanced stage of that disease we may have serumal deposits occurring. Contrarily, the serumal deposits may present first, and after a pocket has been made it is easy to imagine the salivary deposits occurring. Whichever way the final condition may come about, the result is the same,—a combination of both diseases. That uric acid is an operating cause here is more probable than with any of the other conditions.

By what name shall we designate that other dreadful form, where no deposits are present? Once more maintaining my point that the pocket begins at the neck of the tooth and increases towards the end of the root, I will ask you to consider the following explanation of the disease: Any condition of health which will deplete the system and cause anæmia will superinduce a condition about the teeth favorable to the advancement of this form of pyorrhœa. As a local degenerator, I would point to excessive smoking. The constant high temperature may be said to cook the soft tissues to a point where their vital resistance is materially lessened. There is a waste of tissue in all parts of the body because of use. This waste is restored by vital processes of reorganization, and where the vitality is sapped we can easily imagine a general depletion ensuing, with lack of reparative energy. The soft tissues, and also the bone about the teeth, slowly waste. The gums shrink.

They do not recede at first, but they shrivel, their bony support having also melted away. Pus follows. In this condition recession begins. This recession is more marked about the superior molars, and on the palatal side. This is due to the lack of resistance offered to the action of the tongue pushing the food between the teeth in mastication. The force thus exerted wears away the soft tissues at these points. We may or we may not have pus, and its presence is possibly due to bacterial infection. It is well known that bacteria may be present and do no harm until such time when the vital resistance is lessened, or the temperature increased to a point conducive to their propagation. The first condition we would get in either sex from any constitutional ailment resulting in anæmia, and we might have both were the smoking habit excessively indulged in. What part the nicotine would play as a germicide and how it might act as a virulent poison are points worthy of study. These cases, as unpromising as they appear, are exactly the ones which often result in what seem to be marvellous cures. If the general health of the individual is restored, either by medical aid or by change of scene and habit, the local disturbance not infrequently will disappear, and though the gums and much of the bone have been lost, the teeth become firm again.

I have already written much more than I at first intended, and I must therefore allude rather briefly to the points in Dr. Van Woert's paper which attract my attention. He tells us that necrosis is not an accompanying symptom of pyorrhœa, while it has been long claimed that it is. It seems to me that the advance made by the doctor's investigation is more imaginary than real. I do not doubt that technically he is right, and that true necrosis is not commonly to be found in this disease. But there is no doubt that there is a destruction of the alveolar bone, and whether we call it necrosis, caries, dissolution, or absorption is of small consequence. I would take issue with the doctor, however, where he likens the process of destruction to what he calls the absorption of bone which follows the extraction of the teeth. He has made sections of the bone to prove his point. But I too have made sections of bone, and where but one tooth has been extracted, instead of any absorption of the bone, I have found rather an obliteration of the tooth-socket by a deposition of new bone, which is more cancellous than the normal process. Absorption of the alveolar ridge is commonly found only where several teeth have been taken from one locality, and is subsequent to the healing process, or, if coincident with it, it is due to the fact that the destruction of bone has been

great enough to allow a collapse of the remaining walls, so that, when healed, the ridge is shortened. But in pyorrhœa, we have a distinct destruction of the bone, which, if asked to denominate, I should call caries, due to the presence of pus and pressure therefrom.

This brings me to a proposition which I have not seen considered, and which I offer for your future observation and study.

My question is, Whence the pus which accompanies this disease? Is it from the pericementum, or is it from a true pus-generating tissue which replaces the lost alveolus?

In many cases, I have been tempted to believe that the latter is the case; that the pus exudes from the soft tissues overlying the root, and not from the pericementum. If this be true, then we cannot use the term pericementitis. I do not mean that pus never comes from the pericementum, but that in the worst cases it comes chiefly from an opposite direction.

I believe that I have already said enough, as probably you have others to contribute to the discussion, though I had originally intended to touch upon the subject of medicaments. I will, however, postpone that for another occasion.

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#### REVIEW OF PROFESSOR C. N. PEIRCE'S RECENT CONCLUSIONS IN REGARD TO PYORRHŒA ALVEOLARIS.<sup>1</sup>

BY JAMES TRUMAN, D.D.S.

So much has been written on the subject of pyorrhœa alveolaris without any remarkable results following, that I should prefer not to enter the list of disputants, and therefore comply with the request of Dr. Butler with some reluctance, for, in my judgment, it would be better to wait for exact observations than risk possibly crude opinions upon a subject of so much importance as this may prove to be.

The paper is, however, of such a radical nature that it invites discussion, and we are forced to meet it by, at least, past and present experience, or admit that the author's conclusions are correct.

The premise laid down by Professor Peirce is, that we have in

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<sup>1</sup> Read before the Eighth District Dental Society, Buffalo, N. Y., February 26, 1894.

the past been working under a mistake, and that pyorrhœa alveolaris, instead of occurring as a single pathological condition, is in fact a dual presentation, and must be considered from separate stand-points, for he says, "From a careful study of the abnormal pericemental—or rather the alveolo-cemental—membrane, it appears to me that we must recognize two closely allied, but yet very different, pathological states; different, as I shall attempt to demonstrate, in their *etiology*, in their *clinical history*, in their *symptomatology*, and in their *susceptibility to treatment*. . . . In one form of pericementitis the origin of the calcic salt is the saliva, and in the other form, the blood. The former I shall designate as *ptyalogenic* calcic pericementitis, expressive of the idea that in its origin it is *local*, *peripheral*, and *salivary*. The latter I shall designate as *hæmatogenic* calcic pericementitis, expressive of the idea that in its origin it is *constitutional*, *central*, and *associated* with some modification of the normal composite of the blood-plasma."

As this view is so important, I propose to examine it, for not only does it constitute the basis of his argument, but is a wide departure from accepted conditions surrounding this disease.

It is a well-known pathological fact that calcic deposits will not be made, in the majority of cases, in tissues unless there be pre-existing changes present indicating impaired function or absolute death of the part. This being recognized as true, what must be the condition of the apices of the roots of teeth to admit the deposit upon their surfaces? The pericementum must have been in a state of inflammation through an antecedent irritation. This may have been produced by any of the usual disturbances, such as undue pressure, loss of pulp, etc.

It is, therefore, not an impossibility that deposits may occur at these points after destruction of the pericementum; indeed, it must be regarded as a very probable result in gouty subjects.

Before accepting this statement, admitting for the sake of argument that it occurs, it may be well to ask what are the phenomena attending this disease, pyorrhœa alveolaris, as generally understood. There is first an irritation of the pericementum, followed by a gradual destruction of that organ, and synchronously that of the periosteum of the alveolar process. The gum tissue is not primarily involved. The inflammation engendered by the progress of the disease produces pus. Microscopic investigations have proved the existence of pathogenic bacteria. Deposits may or may not be present; generally, in my experience, they are absent. When present, they are, in my judgment, of secondary importance

and cannot be considered as vital to the progress of the disease. These constitute the main presentations at the gingivæ. If this disease be present at the apex of the same root, the manifestations and results must be similar in all respects; pus must be the product of inflammation, and this will find an outlet. The final result is a fistula. Consequently, apical inflammation means eventually destruction of the adjoining tissue, or a condition known as alveolar abscess. If this be true, then the pathology of this disease is well understood and needs no new nomenclature to explain it.

It seems to me to be impossible, and contrary to known pathological laws, that a deposit can be tolerated on a weakened membrane, or one which will subsequently become devitalized by its presence, and the pulp still continue in full activity.

When the subject is viewed in the light of experience, it has not been my observation that any such condition exists at the apical surfaces of teeth except as a result of abscess, and then only in rare instances. Whether in these the calcic deposition will give in all cases the uric-acid reaction remains to be proved, and would require an analysis in every case to demonstrate it. Admitting that it could be demonstrated in every case, it by no means settles the question of the origin of pyorrhœa alveolaris, though we may be forced to admit it as one of the factors in its production.

The reasoning of Professor Peirce in regard to the channel by which uric acid arrives at the pericementum, and through the cementum and the dentine, is open to criticism. He says, "As the current of the lymph-stream is directed for the most part towards the cementum, through its borders or periphery into the lacunæ and canaliculi, and finally in the reverse direction, it is not difficult to see why the deposit should take place on the surface of the cementum, as well as in the meshes of the alveolo-cemental membrane. The constant deposition and pressure of these insoluble salts will act as irritants, engendering the well-known inflammatory states,—viz., congestion, exudation, impaired nutrition, tissue disorganization, and the formation of pus. These changes, taking place here as elsewhere, in the immediate vicinity of the irritation,—that is, on the cemental aspect of the membrane,—lead to its detachment from the cementum and the development of a pus-pocket."

When this quotation is analyzed, it represents the lymph-stream holding the urates in solution as passing into the lacunæ and canaliculi of the cementum without apparently affecting the tissues in transit. On their return, in reverse order, the stream gives up its calcific material, and the precipitation and crystallization result in

irritation. As I have endeavored to show, there must be some loss of power or impairment of function for this deposition to take place; it is reasonable to infer that if the tissue retains full vitality, there would be no formation of calcic deposits. But Professor Peirce does not seem to regard this as an important pre-existing condition, though he does admit that there "might coexist some impairment of nutrition . . . or some faulty innervation." If this be not important, then it is difficult to understand why the deposit is not made before the transit through the pericementum. Why must the lymph-stream take such a circuitous route before it can effect the lesions described? If the urates be the irritants asserted, and impairment of nutrition is not absolutely essential to their deposition, no reason remains why the tooth should not go down to destruction as a whole, and not by degrees, as I believe to be universally the case.

In the discussion of the paper, and practically part of it, Professor Peirce makes the statement that "This disease [pyorrhœa] is not known to be developed, except in very rare cases, until after thirty or thirty-five years of age," and he reasons from this that, as the "uric-acid diathesis is not established until after thirty-five or forty years . . . we would not be likely to find any such condition in our young patients for whom we correct irregularities." This, by direct implication, means that there is a marked synchronism in these two pathological states. Unfortunately for this reasoning, pyorrhœa is *not* confined to thirty years of age, but is found very frequently in persons before the twentieth year; in fact, it is a question whether the age limit can be applied. It is true that after thirty-five the destruction is greater and the disease more deeply pronounced.

"In one form of pericementitis [pyorrhœa] the origin of the calcic salt is the saliva, and in the other the blood," is the rather positive assertion of Professor Peirce. At this stage of the inquiry it might be well, before ascribing a similar origin to both forms and both arising from calcic deposits, to establish the fact, if fact it be, that such deposits originate the lesion in any considerable number of cases. If by naming that originating from the saliva pytalogenic calcic pericementitis, and that from the blood hæmatogenic calcic pericementitis, he means to assert that pyorrhœa alveolaris is invariably produced by calcic deposition, then equally as good observers must part company with him in his conclusions; for calcic accretions from the saliva, it is very safe to affirm, are not the cause of this disease. It is only necessary to refer, by way of illus-

tration, to those teeth most affected with what he terms *ptyalogenic* deposits and mark the result. Examine the lingual surfaces of the inferior incisors and canines, and though ever so much coated with hard, black tartar, *pyorrhœa* does not result, and the same is equally true of the superior molars; indeed, as I understand the disease, it would be impossible for it to take place as long as salivary calculi were present.<sup>1</sup> If this be true of this character of calcic depositions, and it seems to me it cannot be controverted, then it remains equally true that the so-called *hæmatogenic* calculus can have no direct effect of a destructive character not possessed by the salivary calculus. Both alike destroy the soft tissues upon which they impinge, but neither, in my opinion, have any direct action in producing the disease in question.

The position held by Professor Peirce is that local treatment is practically unavailing, as it should be if his premises be correct; but inasmuch as *pyorrhœa alveolaris* has been and will continue to be overcome by local treatment, it follows that the uric-acid hypothesis does not cover all cases.

When it is understood that in dealing with this disease our diagnosis cannot be limited to a circumscribed area, but must have a wide consideration of related systemic conditions, I am forced to agree with the conclusions of the essayist, that lesions of the *gingivæ* may be indirectly aggravated by constitutional disturbances. It, however, remains to be proved that *gouty* subjects are, above all others, liable to this disease, or that to this disease can be accredited the origin of these peculiar *pericemental* inflammations. All disturbances of the normal equilibrium of the system will produce derangements of various organs, and a local irritation may be the progenitor of a series of new foci of inflammation.

A strict parity of reasoning would force the conclusion that if the hypothesis of Professor Peirce be the correct one, then we can equally ascribe the origin of *pyorrhœa alveolaris* to other disturbing elements. In *scurvy* and *syphilis* the *pericementum* is destructively affected, and under proper constitutional treatment will disappear, precisely as it is stated *pyorrhœa* will disappear under proper treatment for *gout*. Certain medicines act in the same way, and *mercurial salivation* is so well known as to need only passing reference.

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<sup>1</sup> I do not wish to be understood by this statement that *pyorrhœa* does not occur on teeth upon which salivary calculus is deposited, but that it does not originate beneath the accretion.



The reasoning that would apply the origin to uric-acid deposits holds good equally for scorbutus, syphilis, and mercurial salivation.

It must be recognized that pathological conditions affecting the system will have a marked impression on the tissues investing the teeth, and in addition to this create changes in the secretions of the oral cavity, from the normal neutral to an increased acidity, thus locally intensifying the disease.

True pyorrhœa cannot, in my opinion, exist anywhere except upon the pericemental membrane investing the cervical portion of the tooth. It has its origin, if I understand it, in first irritation of that membrane, and may then progress, the factor of vitality having much to do with the rapidity of the destruction. The immediate and continuing cause of the inflammation is micro-organisms. As a rule deposits are not found in the pockets. Professor Peirce explains this by supposing that pus washes these out. If removed immediately, how can the parts be affected by their temporary presence?

Whenever differences arise in regard to the character and treatment of pyorrhœa the charge is almost universally made that those in opposition to any special ideas are incapable of diagnosing the disease. It would be a sad commentary on the intelligence of the dental profession if this were true, but it is not true, for the reason that the very simplicity of the disease precludes such an inference. I am, therefore, forced to the conclusion that the marked differences of opinion cannot be attributed to a lack of knowledge of the etiology of this complaint, but rather to improper conceptions of treatment demanded.

The object of this review is not to give my own methods to meet these conditions, for this would be unnecessary, having been published elsewhere, but as teeth have been permanently cured, and that without any resort to systemic treatment for gout or other constitutional diseases, it seems reasonable to conclude that the origin of pyorrhœa cannot universally be looked for in derangements of the general system.

In conclusion, I briefly give the following summary of my views regarding the matter.

1. Pyorrhœa does not occur at the apices of roots as a distinct pathological condition.

2. Deposits may be found there, *but always subsequent to the death of the pulp and pericemental membrane.*

3. That uric acid may affect the membrane subsequent to the

injury of that tissue, but is not directly the producing cause of lesions in that organ.

4. The action of syphilis, scurvy, certain medicines, and general constitutional disturbances have a similar effect to invite this pathological state.

5. *Pyorrhœa alveolaris* is, finally, a local disease, aggravated by systemic conditions, and to be treated upon a clear comprehension of its local and constitutional complications.

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## REVIEW OF PROFESSOR PEIRCE'S PAPER, "PYORRHŒA ALVEOLARIS."<sup>1</sup>

BY DR. B. R. ANDREWS, BOSTON, MASS.

YOUR letter of February 8, asking me for my views regarding Professor Peirce's article on "*Pyorrhœa Alveolaris*," published in the January number of the *INTERNATIONAL DENTAL JOURNAL*, has been received. I hardly know what reply I should make. I do not profess to be a specialist on this subject, although I am greatly interested in it. Recently I have given some attention to the microscopical examination of sections of roots of teeth lost by reason of this disease. I wish to study carefully the very marked change in the character of the dentine of the root, and I should be obliged to any member of your Society who would aid me in this investigation. If they can send me teeth which have been lost from this cause, in diluted alcohol, placing them in this just after extraction, before they have become dry, together with a short history of the case, it would be quite a help to me. I have made a number of sections of these teeth, but want more for comparison. We are to be congratulated that at last we have been thoroughly aroused to the importance of knowing more about this most perplexing disease, "*pyorrhœa*." Indeed, Professor Peirce's article is claiming the attention of the whole profession, and this must necessarily give us results which will lead up to a more successful treatment. I do not know how many cases of true serumal tartar from different teeth, taken from the apices of the roots, have been carefully analyzed. If the number should be large, and all show traces

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<sup>1</sup> Read before the Eighth District Dental Society, Buffalo, N. Y., February 26, 1894.

of uric acid and its salts, it must necessarily go a great way towards settling this theory. The tartar which we find on the palatal portion of the upper incisors just under the gum and on the palatal roots of the molars in the mouths of comparatively young people I have always considered to be one form of true serumal tartar. Some of our oldest and best operators make the statement that patients of whom they have the charge from youth up never contract this disease, although their parents may have lost their teeth by it. Proper care at the proper time has prevented its occurrence. These men are loath to believe that this tartar is a deposit from the blood,—being deposited before pockets are formed. Gouty and rheumatic people among my own patients have not, as a rule, been more troubled with this disease than others. I have not given the uric-acid theory—advanced before Professor Pierce came on the field—much consideration, but the analysis showing the actual presence of uric acid in this deep-seated tartar demands serious consideration and careful investigation. If we go at this work in the same careful manner as that pursued by the worthy president of your State Society while investigating this subject, we should soon settle the question whether concretions of serumal tartar can exist upon or near the apices of roots of teeth, without a break in the continuity of the gum tissue at its gingival border. I have held there could be no deposit, not even of the nodular tartar, without an inlet from the gum to its location. This is one of the important things that we must prove, and Dr. Van Woert's method is the only proper way to investigate. We must look for its solution at dissecting tables and at autopsies. We must interest the students of the dissecting-room, both dental and medical, and before a great while we shall have facts that will give us the exact truth.

Another question arises. Shall it be possible, by any system of medication, to dissolve this deposit from the roots of teeth, in its earlier stages, before the pockets are formed, while yet there is more or less irritation? I do not believe this to be possible. I have been led to believe, from my own experience, that this trouble exists largely in the mouths of people accustomed to luxury,—good livers, people above middle age, who over-eat and under-work. If intelligent medication, with the end in view of eliminating uric acid from the system, and with the proper diet for preventing its formation, shall be followed by a cessation of the symptoms and the trouble itself, it must necessarily prove the accuracy of Professor Peirce's hypothesis. Enough has been proved to make it the duty of every conscientious operator to carefully carry out this scheme of medi-

eration, and after proper time report the results to his society. All the care that has been given to the removal of tartar from the roots heretofore, together with the thorough use of antiseptics, must be continued with the additional medication suggested. This theory of Professor Peirce appeals to every one of us; it sounds rational; it seems the most plausible solution of this difficult problem that has been offered.

Professor Peirce calls our attention to one very important fact, and that is, that disturbed functional activity causes the deposition of the salts of uric acid in the tissue of the pericementum, and any undue irritation, even the simple wedging of teeth, may start up this trouble. If this danger signal shall stop many of the younger members of our profession, and some of the older ones too, from the excessive use of the wedge, it will prove a great blessing to suffering humanity, and perhaps save their teeth from "hæmatogenic calcic pericementitis."

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#### REVIEW OF PROFESSOR PEIRCE'S PAPER, "PYORRHŒA ALVEOLARIS."<sup>1</sup>

BY S. H. GUILFORD, D.D.S., PHILADELPHIA.

In undertaking to express my views upon the subject under consideration, I regret that I have neither any new views to present nor new methods of treatment to offer.

In common with other busy practitioners, it has been my lot to encounter more cases of this disease than I cared for, and to meet with less success in its treatment than I had hoped to attain. The insidious character of the disease and its seemingly growing prevalence certainly lay upon us, as professional men, an increasing obligation to try to fathom the mystery of its etiology, in order that our remedial measures may have a scientific foundation.

The first one, so far as I know, to give this disease anything like the attention it deserved was Dr. Riggs, who, while he paid little attention to its etiology, deserves great credit for the assiduity with which he labored for the amelioration of the condition and the success which attended his efforts.

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<sup>1</sup> Read before the Eighth District Dental Society, Buffalo, N. Y., February 26, 1894.

His treatment was largely mechanical, but it was a long step in the right direction, for it not only afforded relief from suffering, but measurably checked the progress of the disease. The removal by instrumentation of the only apparent cause of the trouble was the best treatment that had been suggested, but it fell short of real efficiency, because the remote cause of the trouble had not yet been discovered, and all treatment was therefore palliative rather than remedial or preventive. We were aware of the calcareous nature of the deposit on the roots of the teeth, which was the immediate cause of the disease, and also recognized its general similarity to the calcic deposits found upon the crowns of teeth, but it was left for Ingersoll or Black (one or both) to determine that it was a deposit from the blood, and that any means adopted for its prevention must deal with causes of a constitutional character.

Following up this line of investigation, Professor Peirce has lately advanced the theory, based upon analyses of the deposit, that the primary cause of the disease is a uric-acid diathesis. His analyses showed the presence of the urates of calcium and sodium, in addition to the phosphate and carbonate of lime, which make up the bulk of all calcic deposits.

As these salts are similar to those found in the exudations of gouty subjects, he very naturally concludes that the origin of the two diseases, gout and pyorrhœa alveolaris, is identical, and in each case is due to an excess of uric acid in the blood-plasma.

Now, while there is a degree of plausibility in the theory as set forth in the *INTERNATIONAL DENTAL JOURNAL* for January of this year, it lacks confirmatory evidence in several particulars.

In the first analysis given, only three specimens had been examined, and of these but two showed the presence of uric acid in any appreciable quantity. In the second analysis, made by Professor Brubaker, "some six or eight specimens were examined, in three of which only urate of soda crystals were found." It will thus be seen that at most but eleven specimens had been examined, and of these only five, or less than one-half, gave positive evidence of the presence of urates.

Certainly, the number of analyses was entirely too small upon which to base a theory, and their results too unfavorable to serve as confirmatory proof. In describing the difference between serual and salivary calculus, he speaks of the former as being *constitutional* and the latter *local* in its origin. Now, to my mind, if one is constitutional, the other is also, for the saliva must receive its calcic constituents from the blood, since there is no other source

from which they can be derived. Both forms of calcic deposits being therefore derived from the blood, the one directly, and the other indirectly through the medium of the saliva, the experiments would have been more complete and of greater value had both varieties of the deposit been examined for urates. It is possible that they would have been found in each, and in such event would hardly have been considered confirmatory of the theory advanced.

If it should be granted or proved, however, that the exudations and deposits are the same both in gout and pyorrhœa, and their origin similar, we ought to find the two diseases—or rather the two manifestations of the same disease—commonly associated in the same individual. Is this the case? Although Professor Peirce and certain others think they have noticed this relationship, we seriously doubt whether it exists in many cases.

That both should be found occasionally in the same individual is not to be wondered at, for gouty manifestations are far from uncommon and pyorrhœa is multiplying its victims very rapidly; but two diseases of totally different origin are frequently found in the same individual.

To prove a common origin, they would both have to be amenable to the same line of treatment, and until the identity of the two conditions is thus established, we must class ourselves among the doubters or unbelievers in the theory advanced. In all the cases of pyorrhœa that have come under my observation, I have found very few in which gouty manifestations were certainly present, while the number of individuals suffering with gout unattended by symptoms of pyorrhœa is excessively large. The experience of others in this respect may be different from mine, but having lived to see so many theories based upon a slender foundation first accepted, then investigated, and finally disproved and discarded, I, for one, have come to the point of requiring for the acceptance of any new theory a stronger array of facts and confirmatory evidence than has been presented by Dr. Peirce in support of his hypothesis.

REVIEW OF PROFESSOR PEIRCE'S PAPER, "PYORRHŒA ALVEOLARIS."<sup>1</sup>

BY M. L. RHEIN, M.D., D.D.S., NEW YORK.

YOUR communication of the 21st inst. at hand, and while I cannot be with you, I trust the discussion of pyorrhœa by the Eighth District Society will be a profitable one. There is no topic in our pathology that should interest us more than this one until its etiology has been well-established and agreed upon. That a very common type of pyorrhœa exists as a result of the uric-acid diathesis is not a new doctrine by any means. Cases due to such causes have been treated in a constitutional manner for many years.

If Professor Pierce intends in his latest papers to set up the claim that all the cases of genuine pyorrhœa have this source, I must differ with him. I do not, however, understand him in this way, but merely that he has picked out one of the most frequent causes of the disease, and endeavored to prove by chemical analysis of the deposit on the root that it is a result of the faulty metabolisms of that particular system.

Has he proved to our satisfaction that such patients have uric acid in some form in the deposits, and that patients free from pyorrhœa have no traces of uric acid in their salivary deposits?

I am in doubt at the present time how to answer the question. A half-dozen birds will not do for a flock, neither will a few isolated chemical tests definitely determine a disputed point in pathology. My own views of the subject would naturally tend to induce me to give the firmest adherence to his belief that an exudation of urea in rheumatic or gouty subjects would proceed through the pericemental tissues. Can we not find this same exudation of urea in comparatively healthy people? I am also not prepared to answer this question; except that if any one chooses to place firm reliance in the three uric-acid tests stated by Professor Peirce in the January number of the INTERNATIONAL DENTAL JOURNAL, then that same party will be obliged to form the opinion that uric acid is a natural constituent of all calculary deposits on roots of teeth because the test No. 2, the dry or destructive distillation test, will produce as its result free ammonia gas,  $\text{NH}_3$ , on any specimen of calculary deposit

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<sup>1</sup> Read before the Eighth District Dental Society, Buffalo, N. Y., February 26, 1894.



that may be used from the healthiest of mouths. The truth of the matter is that this is not a fair test, for it is impossible to obtain deposits around roots which will not contain more or less organic matter, and as a result there is present nitrogenous matter which will invariably give out the ammonia fumes. Finding one of Professor Peirce's three mainstays as weak as this, it behooves us to corroborate his experiments with care and multiplicity before we ought to come to a just conclusion as to whether uric acid is found in some calculary deposits and not in others.

I am working very earnestly in this field, and although not prepared at this moment to formulate my own views, yet I feel constrained to say that I do not attach the importance to Professor Peirce's paper which it has especially received in this month's *Dental Cosmos*.

The general attention which it is receiving at the hands of the profession is due to the majority of dentists knowing so very little about how to make a differential diagnosis in diseases of the oral tissues. We have no right to undertake the treatment of a case of pyorrhœa alveolaris without first subjecting the patient to an examination so careful and critical that the condition of the vital organs are clearly set before us. Such an examination properly made will as certainly bring about a proper diagnosis of that particular case, and if we find the urine loaded with urea products, we can safely write in our record books pyorrhœa rheumatica, but no more safely than we can in another case write pyorrhœa diabetic, or pyorrhœa pericardial, etc.

In plainer words, my investigations have led me to believe that the etiology of pyorrhœa varies, depending on any disease that is powerful enough to bring about abnormal metabolism; and as we have pus exuding in all these cases, the most appropriate nomenclature is to retain the word pyorrhœa, adding as its adjective the disease which is the direct cause of the perversion of the nutrient function.

When Professor Peirce states that in these hæmatic types the deposits commence on the end of the root and proceed to the neck of the tooth, he makes a remarkable assertion; he offers no proof to back it up, and it is contrary to the observations of all my friends that I have discussed the subject with. Many cases have come under my notice which at first glance would tempt me to say this deposit has commenced at the end of the root, but a more careful examination invariably caused me to change my mind.

To close, I would say that with me the question of etiology is not one in dispute; my only regret is that all of the profession have



not eyes opened wide enough to see clearly. There is, however, a vital burning issue in the treatment of pyorrhœa, and it consists of this: How shall we restore lost tissue?

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## COMMENTS ON PROFESSOR PEIRCE'S PAPER, "PYORRHŒA ALVEOLARIS."<sup>1</sup>

BY ALBERT P. BRUBAKER, M.D., D.D.S., PHILADELPHIA.

In reply to your request, I send to you a few comments on the view which Dr. Peirce has adopted respecting the causation, pathology, and treatment of pyorrhœa alveolaris. It would be superfluous for me to add any facts or arguments from the field of dental pathology which would corroborate the view that pyorrhœa is but a local expression of the gouty diathesis. I will, therefore, simply present a few facts taken from the field of general medicine which will, perhaps, assist in demonstrating the dependence of pyorrhœa on a constitutional disorder.

At the outset it should be made clear as to what pathological condition is embraced by the term "pyorrhœa alveolaris." According to Dr. Peirce, and with him I fully agree, it is not that pathological condition which, beginning at the gum margins as a simple inflammation, advances towards and involves the pericementum, and even leads to the formation and discharge of pus. This is a purely local condition,—though capable of being aggravated by vitiated systemic states,—established by the deposition of salivary salts, on the removal of which the inflammatory process subsides. This form of pyorrhœa is not to be confounded with that specific inflammation of the pericementum which begins at or near the apical extremity of the root, and which is attended by the formation of pus, the absorption of the alveolar process, and the eventual loss of the teeth. This inflammation is of constitutional origin, established by the deposition from the blood of specific matters which chemical analysis has shown to be calcium and sodium urates and free uric acid. The chemical character of these salts is proof positive that their deposition is indicative of a constitutional or nutritional disorder. Owing to the difficulty experienced in removing this deposit, and owing to the fact that it is as constantly being

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<sup>1</sup> Read before the Eighth District Dental Society, Buffalo, N. Y., February 26, 1894.

renewed, the inflammation and its concomitants have resisted all local treatment which has been employed.

Now, it is this chronic, persistent, destructive form of pericementitis, which is to be regarded as an expression of the gouty diathesis. This differentiation of the pericemental inflammations into two distinct forms—one local, the other constitutional—must be clearly recognized in order to comprehend the pathology and treatment of the disease under consideration.

That the pericemental membrane the vitality of which has been lowered by mechanical or chemical agencies may become the seat of uratic deposits is in harmony with pathological processes occurring in other portions of the body.

The mucous membrane of the bronchial tubes, the vitality of which has been impaired by various causes, may become the seat of uratic deposits, which will give rise to a persistent inflammation, attended by increased and altered secretion, which resists the customary therapeutic means, and yields only to an anti-gout treatment. The mucous membrane of the pharynx, from the deposition of similar materials, will become the seat of an inflammation which is characteristic. The gouty throat is easily diagnosticated. At times small masses of calcium urate are discharged from the mucous follicles of the mucous membrane. Many other instances might be cited confirmatory of this view. Looking at all the facts, it is readily conceivable that the pericemental membrane is just as susceptible to uratic deposits as any other tissue, and that a gouty pericementitis (otherwise pyorrhœa alveolaris) finds its analogue in gouty bronchitis, gouty pharyngitis, etc.

It is needless to say that in all these instances the patient was the victim of that perverted nutrition which is known by the term gouty.

That this form of pyorrhœa, which Dr. Peirce regards as an evidence of the gouty diathesis, is so in reality is demonstrated by the fact that the deposit is similar in all respects to deposits found in other tissues the seat of inflammations long since recognized as of gouty origin. The objection that patients suffering from this persistent pyorrhœa are not always gouty is only valid when it has been proved that they are not gouty. The burden of proof must rest with the objectors, in view of the facts which have been adduced regarding the causation, and which will be adduced in reference to treatment of pyorrhœa. The common assumption that gout is but an inflammation of the joint of the large toe or the joints of the fingers is highly erroneous. This diathesis may manifest

itself in a multiplicity of ways. Nervous disorders, cutaneous inflammations, visceral derangements innumerable may be established by the deposition of uric-acid salts. The diagnosis of these gouty manifestations is only possible with those clinicians who have familiarized themselves with the protean character of this diathesis. It is a fair assumption, and one supported by observation, that the large majority of pyorrhœa patients present other symptoms of gout. A careful examination of the patient's physical condition and an investigation into his family history will frequently, if not always, disclose some gouty manifestation.

In dental medicine, as in general medicine, the specific character of any given pathological condition may frequently be inferred with a reasonable degree of certainty from the results of specific treatment. If some obscure chronic inflammation, which has resisted all forms of medication, should yield and disappear under the administration of quinine, mercury, or colchicum and the alkalies, it would be a fair assumption that the underlying cause of the morbid state was the malarial, syphilitic, or gouty diathesis. If a chronic inflammation of the pericementum, after resisting local treatment for months and years, should yield and disappear under an anti-gout treatment, the practitioner would be justified in regarding the disease as but a manifestation of gout. Now, the facts which have been elicited by Dr. Peirce in the treatment of pyorrhœa absolutely support this view. An outline of the treatment adopted by him has already been published. A detailed treatment with the result is forthcoming. It is only necessary for me to say that it is strictly along the lines of dietetic, hygienic, and medicinal means adopted by clinicians in the treatment of all forms of gout.

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#### COMMENTS ON PROFESSOR PEIRCE'S PAPER, "PYORRHŒA ALVEOLARIS."<sup>1</sup>

BY EDWIN T. DARBY, M.D., D.D.S., PHILADELPHIA.

YOUR letter of February 5 came duly to hand. I am not yet prepared to commit myself to the theory which Dr. Peirce has advanced as to the cause of pyorrhœa alveolaris. I am free to admit that he has made suggestions which look wonderfully reasonable, and

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<sup>1</sup> Read before the Eighth District Dental Society, Buffalo, N. Y., February 26, 1894.

I shall not be greatly surprised if before many months shall have passed away additional proof will be furnished which will confirm his theory. As yet he has not proved that uric acid is always present in the deposits to be found upon the roots of teeth in which pyorrhœa alveolaris has been known to exist, nor has he proved that uric acid is not present in the mouths of persons who have no disease of this character or in whom there is not known to exist a gouty diathesis.

Of late the disease known as gout is made to stand as godfather and sponsor for so many conditions that I sometimes fear we may overreach the mark and make it appear that nearly all our imperfections are the result of the uric-acid diathesis.

The medical profession of America is recognizing a peculiar condition of things in the American people which does not exist to the same extent in any other nationality, and which is doubtless the result of our mode of living, and which they have denominated "American gout." It is not the gout of England, which it has been thought was the result of port wine and beef, and which began in a man's big toe and made him wish he were dead, but it is the gout of malnutrition, and that is the result of a nervous exhaustion from overwork and *under-feeding*. I do not mean by this that food enough does not enter the system, for it does, but it is the inability of the system to properly appropriate that food, no matter what the character of it, that loads the system with uric acid. So far as I can learn, uric acid has never been found in the saliva; hence uric acid would not be found in *salivary* calculus, but it is nearly always present in the blood of gouty subjects, hence it might be found in the *serumal* deposits at the apex of the roots of teeth which have been lost by pyorrhœa alveolaris.

I am strongly of the opinion that Dr. Poirce is right, and I am also of the opinion that his description of the progress of the disease is the correct one. Pyorrhœa alveolaris is *not* a disease beginning at the gingivæ and the result of a local irritation, but a constitutional condition, and I trust that we shall soon know that it is accompanied with a gouty diathesis.

## REPORT OF AN OPERATION.<sup>1</sup>

BY DR. S. E. DAVENPORT, NEW YORK.

DENTISTS are occasionally called upon to treat mouths in which, while there is no particular tendency towards pyorrhea alveolaris, certain teeth, usually the lower incisors, will be found very loose, the bony process much absorbed, and the gum thickened and spongy, with perhaps a slight exudation of pus.

This condition in such mouths is usually of local origin, caused by the encroachment of salivary calculus, the other teeth in the mouth being ordinarily in very good condition and of unquestioned longevity, and it always seems sad to be obliged to advise the extraction of these loose teeth, particularly as it is difficult to replace them with artificial substitutes which shall be both comfortable and natural.

I will confess that on several occasions I have seriously considered the advisability of in some way fastening such teeth securely to the firm ones of the same jaw, for the sake of saving the patient the annoyance of a plate, although recognizing at the same time the many objections to all such plans.

On one occasion the temptation to attempt the retention of such teeth was increased by the pleadings of the patient, a gentleman about seventy years of age, in good health and of good physique, who had more than the usual horror of artificial teeth, assuring me that he would bear any fatigue and put up with any discomfort if I would but save his natural teeth.

The teeth had as usual elongated considerably, and when the jaws were closed, the four inferior incisors would sometimes shut inside and sometimes outside the upper ones, though the roots were long and still had quite an attachment to the gum.

The first step was to grind down the elongated teeth with corundum stones until they would clear the upper ones when closed. This made the teeth very broad at the top, and enabled me to cut a rather deep longitudinal groove in the cutting-edges of not only the loose incisors, but also the firm cuspids on each side, into which groove a small twenty-karat gold wire was fitted, filling about one-half the calibre of the groove.

At the next sitting, the rubber dam being first adjusted, the gold wire was secured to its position in the groove with zinc phosphate,

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<sup>1</sup> Read before the New York Odontological Society, January 10, 1894.

which, when fully hard, was cut away from two teeth at a time and replaced by semi-cohesive gold, malleted in, each tooth being held as firmly as possible with the thumb and fingers of the left hand while being worked upon. It was, of course, difficult to pack the gold as solidly around the wire in the loose teeth as in the two cuspids, but by looping the strips of gold over the wire from one side of the groove to the other, a very good adaptation was obtained, the fifteen-per-cent. platinized gold being used for the surface to give the greatest possible resistance to the forces of mastication.

The operation was successful in that the teeth were firmly held and made perfectly comfortable for the patient, who was instructed to use a small quill tooth-pick between the teeth after each meal, in addition to the usual thorough rinsing, so that the proximate surfaces might be kept clean.

At a subsequent sitting, the teeth were scaled and the gums treated, and within two weeks the discharge of pus had ceased, and the gums took on a healthy color and appearance.

This operation was performed in June, 1890, and was satisfactory in its results for just one year, when the gold around the wire in two of the incisors loosened. After new gold had been packed into those two teeth, I felt obliged to admit that the teeth could not be kept for any great length of time unless some additional protection could be given, as the strain from incising and masticating was too great for the strength which could be obtained.

An impression was accordingly taken, and upon the dies obtained a cap of pure gold, about No. 30, was swaged to fit the upper two-thirds of the lingual surfaces of the six teeth, and extending over the tops of the teeth to a point, perhaps, one-fourth of the distance down the labial surface.

This cap, being carefully fitted, was cemented to place, in June, 1891, with zinc phosphate, and the edges of the cap burnished to the teeth wherever possible.

This pure gold cap has become loose, I think, twice since it was first put on, but it is easily readjusted and has in every way fulfilled my expectations, for the teeth are preserved, and, I think, can be indefinitely.

Such a contrivance would be unsightly in a lady's mouth, but this gentleman, having a heavy moustache and beard, exhibits the golden line only when the joke is a particularly good one.

It would be a brave man indeed who would make a claim of originality for anything before this Society, and I will therefore

say that I knew of the use by other dentists of this method for securing loose lower incisors years ago, so far as the gold wire and the strengthening filings about it are concerned, but if the pure gold cap has been used by others I have never happened to hear of it.

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## COMBINING RUBBER FILINGS WITH FRESH RUBBER.

BY DR. W. S. SIMONTON, WEST VIRGINIA.

To many it may be difficult to imagine that filings and scrapings from finishing plates can be of any value, yet they can be made very useful. After the rough and dirty portions of the plates are scraped or filed off, save the balance, and in packing a thick heavy plate, first dip the rubber in warm water to soften, then roll it in the filings, and pack as usual; vulcanize carefully, and I will insure a good plate, well vulcanized, strong and tough and not porous. Rubber treated thus before packing vulcanizes in less time.

In heavy plates it is well, of course, to vulcanize carefully; but with ordinary care the plate will not become porous. I use this method in all plates, even where required to be made thin, as it vulcanizes five or ten minutes quicker, and I think produces better results. Formerly, in some very thick portions of plates, especially those that require much building upon the sides, it seemed almost impossible to prevent the thick heavy portions from becoming porous; all brands of rubber are alike in this respect, but since using this method I have not had one bad result or one porous plate. Porous plates have always been a source of trouble and much extra work. But this method of rolling each piece of rubber in the filings from finishing plates, I think, will be found to always prevent any trouble from this source. Try it, and if you have no filings saved and have a heavy plate to make, from an old plate make sufficient to pack the one on hand.



## Reports of Society Meetings.

### NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, January 16, 1894, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, with the President, Dr. Brockway, in the chair.

#### INCIDENTS OF OFFICE PRACTICE.

*Dr. S. G. Perry.*—At the meeting held in Brooklyn a week ago last Monday, Dr. Darby read a paper on the subject of filling-materials, and took occasion to speak very favorably of tin-foil, and also to show before that society some specimens of tin which had been shaved off a revolving wheel of block tin attached to a lathe. He made the claim that pure tin, when prepared in that way with a fresh surface, possessed an adhesive property which is not found in tin-foil, and he showed some specimens of the tin prepared, and a large number of teeth which had been filled by his students, where the fillings had been built up to quite an extent,—as much as would sometimes be seen with gold, which of course would not be possible if the tin used had not a considerable adhesive property.

On Sunday last, in his laboratory, he exhibited to me his method of shaving off the tin, and I asked him to allow me to present some of the shavings to the members of this Society. I had my secretary put up fifty packages in this form, hoping there would be enough so that each one could try it. When it is first shaved off from the wheel there is no doubt it has cohesive properties which we have never found in tin-foil. Dr. Darby has used tin in this way for about eighteen years. I cannot tell you to what extent he has used it during that time, but he exhibited his old book of lectures to his students, in which he explained this as one of the ways in which tin could be used. I have tried it in quite a number of cases since he has shown it to me, and it certainly works well. How long that cohesive property will continue of course I do not know. I suppose it will be lost after being exposed to the air for a while.

It affords me an immense amount of satisfaction to see this question brought up in this way. In a paper which I read in Brooklyn the month before, I spoke very strongly in favor of tin-foil. Tin



was the material I learned first to fill teeth with, and I have never lost my love for it, not only because of the ease with which it can be worked, but because of its remarkable preservative properties. One of the greatest compliments that can be paid to tin-foil is that you have heard men all your life say, when a new kind of gold is introduced, "Why, it works more like tin-foil than any gold I ever saw."

To-day I saw the remnants of a tin filling on the approximal surface of a molar tooth which a patient of mine said I had put in about fifteen years ago. It had worn away until there was only a slight layer in the cavity. I had not seen her for a long time, and the tooth had remained for quite a long period only partially filled. I took the remaining portion of the filling out of the cavity, and put in a new one without touching the tooth with an instrument. I simply put in a new tin filling where the old one had been. I think it would be a great good fortune to patients as well as operators, if there could be a sort of revival of the use of tin-foil. I certainly feel that in our search for other materials we have overlooked this material. We have given it the go-by, and many of us without any reason. I believe that a revival of its use would be a good thing, used discriminately, of course, particularly in the grinding surfaces of young teeth, and on certain buccal surfaces, but not too much perhaps on proximal surfaces, because we all know there will occur that softening which is due probably to acid action; for a tin filling does better if the surface is exposed where there is a little attrition to keep it bright and smooth.

In years gone by I have many times filled young front teeth on the proximal surfaces, using tin-foil instead of gutta-percha. Of course it makes a little shadow between the teeth, but it does not discolor. Sometimes it will be found to be more durable than gutta-percha, where the teeth are not quite ready for gold fillings.

*Dr. Lord.*—I have recently made a change in the so-called sickle instrument, and I find it to be a very great improvement.

It consists simply in the grooving of the edges, which at once gives a thin and sharp edge in the place of a rectangular one.

The instrument should always be made the width that is desired, since to reduce the width would take out the groove. The thickness may be reduced, as will readily be seen, without disturbing the groove.

The sharpening may be done either with a fine sharp or new file or on a bone. The sharpening will of course, in time, more or less reduce the thickness. As it is intended that the groove shall be in

both edges, the inner and the outer, the instrument can be used in the pushing quite as much as in the pulling effort, which is a most important feature.

It is well understood that the instruments for the removal of the tartar from between the teeth must be quite thin, but, as will be seen by the samples which I have brought to the meeting, the thin edge cannot receive much of a groove. The depth of the groove will depend upon or vary with the thickness of the blade of the instrument.

I have found, I may say, that instrument-makers do not readily get the right curve or the proper length of it; so I have had the instruments brought to me before they are tempered, that I might see that they were quite right.

I believe it will be found that these instruments are also most excellent for trimming the margins of foil fillings, as the edges so surely detect any roughness or want of perfect finish.

*Dr. Francis.*—I feel that the profession is greatly indebted to Dr. Lord for having introduced this instrument; also the original sickle-shaped instruments. I could hardly do without them in my practice, and have blessed Dr. Lord many times for devising them. After Dr. Perry had finished speaking about tin and Dr. Lord took the floor, I thought Dr. Lord would refer to a case which he spoke of on a former occasion, where a tin-foil filling had preserved a tooth in a lady's mouth for sixty years.

In my early practice tin-foil was much used, and even now I believe it is one of the best materials that can be employed for filling frail teeth. It is not used much at present for the reason, probably that it is much more difficult to introduce than plastic stoppings. A gentleman who has for many years lived in Europe called on me somewhat recently, showing me a tin-foil filling in a superior sixth-year molar which I put in twenty-five years before. He came the first time to have the tooth extracted, but I advised him to have it filled, and he consented. In the mean time other teeth on each side of it had disappeared, yet this one remained, and was in good condition. He called it his "memorial tooth."

An incident recently came to my observation which I think sufficiently interesting to relate. A few months ago a gentleman about thirty-five years of age called to have me extract the root of a tooth which he said was a source of much annoyance, causing severe headaches. On examination I found a partly decayed root of a left superior central incisor. This I removed. I said to him that it did not seem possible for this fragment of a root to cause such headaches,

and requested him to call again in case he had further trouble. I met him a few weeks afterwards, when he said he would give me an incident of his early history which he thought might account for his headaches. When about fifteen years of age he had a decayed tooth (pointing to a space formerly occupied by a superior bicuspid) which he neglected to have filled. It decayed more and more until the crown broke entirely away. He was annoyed by collections of food crowding into the root, and was in the habit of using a pin to work out the collections. This practice was kept up for a long time, until he penetrated the canal its entire length. One day, while occupying his time in this manner, his attention for a time was diverted, and he forgot the pin. After a while it came to his mind, and he wondered what became of it. He did not recollect removing it, and yet he hardly believed it was still in the root, nor could he feel it with his nail. This occurred twenty years ago. Soon after I extracted the root of the incisor he experienced a peculiar sensation in the upper part of the nares which caused him to sneeze. Something rough passed out which he secured with his handkerchief. It proved to be a section of the pin, about one-third of it, with the head. A few days after another section appeared, which proved to be the pointed end. About one-third was still missing. He washed the parts secured, and kept them for me to examine. They were much eroded. The pin, it seems, during the twenty years had been gradually travelling from the bicuspid root up into the antrum and so into the nares, where it found its way out.

*Dr. Davenport.*—It has been my opinion for a number of years that many of our members were not interesting themselves sufficiently in the work of the Society, and the report of the executive committee, a portion of which has just been read, has very properly emphasized that idea. It stands to reason that in a society of this sort, composed as it is of fairly representative men, there are members who perform frequently peculiar operations which, if reported here, would help many of us in like cases of emergency, and if it did not give an idea of what to do, it might at least warn us, and show conclusively what not to do.

Every member of the Society ought to write a short casual communication describing some operation possessing peculiar, even if not original, features, and if we could have at every meeting one or two little descriptions of that sort I believe it would make our proceedings spicy, and would be a help to the membership as well as to our readers. If I may be allowed this evening to take the initia-

tive, I should like to make a short report of an operation which to me was a little peculiar.

(For this report of Dr. Davenport, see page 253.)

*Dr. Watkins.*—Inasmuch as Dr. Davenport has taken us to task for not extending our ideas further than our own offices, I want to relate something which I think originated in my office many years ago, and which I do not think I ever told this Society, in regard to taking impressions, and occasionally in applying the rubber dam or perhaps the napkin in filling. Many people are very sensitive, and will become nauseated at the slightest touch at the back part of the tongue or the roof of the mouth. This can be overcome readily, I presume, in every case, by simply applying a little spirits of camphor to the tongue. A couple of drops will allay that sensation almost instantly, so you can take your impressions just as nicely as if the patient were not at all sensitive at any time.

In regard to tin-foil, I have used it considerably in connection with gold, nearly filling the cavity with tin-foil, and then simply covering with gold, using White's extra tough tin-foil, which seems to be quite cohesive, and three-quarters or perhaps seven-eighths filling the cavity, say large approximal cavities, and then covering the edge with gold, which will show when the patient laughs. I saw a case only a few days since which I filled in that way ten or eleven years ago. The gold was there and quite perfect, although the tin showed a little through the gold, so that it was not the bright natural color that gold should be.

*Dr. Rhein.*—I was very much interested in the remarks of Dr. Davenport with reference to uniting loose teeth by filling. Some of the members present may remember a case of this character that I presented in 1888, at the annual meeting of the First District Society. The reason that I advocated the method there employed was to avoid as much as possible showing the gold. I have had considerable experience in holding teeth in this manner, having used the method that Dr. Davenport relates quite frequently. There arise many occasions where it becomes very valuable to be able to hold loose teeth together by uniting them by a wire filled into the cutting surfaces of the teeth, and this can be done almost without any unsightliness, granting that in some cases the work may require occasional repair. The case I reported at that time is in absolutely good condition to-day. That was done in 1887, and I have had to repair it slightly three times in different places. One point that I wish to bring out in the practical use of this method, which Dr. Davenport, I think, overlooked in doing his first opera-

tion, is this: he spoke of holding the wire with his fingers while inserting the filling. This seems scarcely adequate to bridge the proximal spaces with the filling, or to hold the wire and teeth sufficiently firm. The method I adopt is to embed all the teeth in oxyphosphate of zinc, having previously ligated them in proper position; make a mass thick enough to go around both the labial and lingual surfaces, if it is on the inferior jaw, so that the teeth are held thoroughly impacted in the mass. Allow that to harden thoroughly before the filling is commenced. You then have the teeth absolutely firm, and can do the entire operation, going along from one tooth to the other. If you picture it in your mind, you can readily imagine the oxyphosphate passing between the approximal surfaces of the teeth so as to give you a bridge to build across, and afterwards trimming away the oxyphosphate. The point I wanted to especially bring out was this method of holding the teeth while the filling was being introduced. I do not believe the operation is a new one. I never claimed any originality for it *per se*, but I do say that I had never heard of its use in the treatment of pyorrhœa alveolaris before I introduced it. I have seen the revered Dr. Atkinson use the method in fractures of the maxillæ where the teeth had become loosened, and I suppose the idea obtained a foothold with me from witnessing his use of it for that particular form of work.

The secretary read a communication from Dr. H. G. Mirick, expressing his thanks to the Society for having proposed him as an honorary member.

Dr. J. Morgan Howe then presented his paper on "Alloys as Nostrums and as Subjects for Investigation."

(For Dr. Howe's paper, see page 211.)

*Dr. Crouse.*—I am not far enough along on the question of amalgams to talk about it. I never have found a manufacturer of amalgams who could make the same formula twice alike. I do not know of any (and I have made considerable tests) whereby they have gotten so they melted the metal and did not disturb some of the baser metal in the compound. I have not solved the question yet, although I hope to. I sent Dr. Howe some specimens a few days ago, and I believe he asked me for the formula. I dictated the formula, but I do not know whether I sent it to him. When the question of aluminum amalgam came out, I had some friends who were anxious to have me test it and see what I thought of it in a practical way. I went at it with a great deal of doubt, and did not believe in it, and took hold of it with the expectation of condemning the aluminum in it as an ingredient, but to my sur-



prise and not to my dissatisfaction, I found that there seemed to be something in aluminum amalgam that I had not supposed would be there. Then I wrote to inquire about it of Carroll, to find out how much aluminum was in it, and he wrote me it was nearly all aluminum. I ordered ten ounces of his amalgam, and put it into three different hands, and not one of them found more than two per cent. of aluminum in it. Of course I was not much surprised at that, but I am surprised to know the effect of the aluminum. I took the same formula and added a little bit of gold to make it set a little quicker. I have made several experiments. The most important thing is to know what metals you want in amalgams, and the next thing is how to put those metals together and know that you have the proportions there. My superintendent was prejudiced in favor of fine amalgam, and I think you will notice it is finer than we had before. There should be a machine that would cut it nearly uniform in whatever grade you want it. I think a milling machine would give you an almost uniform grain.

This is a question I am very glad the Society is agitating. I am having a furnace made to see if we cannot get it without burning some of the baser metals out. At present it is not possible to put together two per cent. of aluminum and a certain amount of gold and copper and zinc, and know that they are all there when we get the compound out. I have also thought that the question of how amalgam will appear in different mouths is not settled.

*Dr. B. C. Nash.*—As I understand it, Dr. Howe experimented with several alloys as they came to him, and by a process of sifting obtained a number of batches, the grain of which varied in degree of fineness. In conversation with a manufacturer, I learned that the quality of grain in high-grade alloys is invariably fine, no matter if the file used in cutting it be coarse or fine.

*Dr. Hammond.*—A metallurgist, Dr. Crouse, has spoken of not being able to secure absolute uniformity in his alloys. That is possible. It is so possible, that by weighing your materials before putting them into the furnace and weighing the resulting ingots (taking, for instance, a forty-ounce batch), the loss may be from one to ten grains. Anything more than this is carelessness or inexperience in the experiment. I have had a great deal of experience in smelting different metals, and feel competent to say this. That there is a variation in the working many times, is true; it is not necessary, however, that it should be from a difference in the formula or accidental. The mere fact of cooling slower or faster will make a great deal of difference in the hardness of the amalgamation when it is

worked up with mercury. If you chill it instantaneously, the amalgamation is almost impossible. I am speaking now of high grade alloys, which have a considerable proportion of silver, whereas, taking these same alloys and cooling them slowly, they work very much smoother.

Adjourned.

JOHN I. HART, D.D.S.,  
*Editor New York Odontological Society.*

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### AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at the Boston Medical Library Association Rooms, Wednesday evening, December 6, 1893, at 7.30 o'clock, President Smith in the chair.

The subject of discussion for the evening was "Orthodontia."

*Dr. H. A. Baker.*—Mr. President and Gentlemen,—Dr. Ainsworth and I do not claim to bring anything new before this meeting. We merely show a method by which regulating is made easy. We believe this method to be adapted to a greater variety of cases than any other of which we are familiar. It has to do with bands, a spread-plate, and retaining spurs.

The band is, in many ways, original with Dr. Ainsworth. He has already brought it before this society. I have of late adopted it in most cases.

The spread-plate differs from others in this respect, that the screw is made of German silver and the nuts are vulcanized into the rubber. With this appliance, you can push the teeth on one side more than on the other by properly slanting the screw; this can be done although the plate is split equally on both sides. Dr. Ainsworth, I think, claims the originality of this arrangement.

The spur I believe to be original with myself, and is adapted to the retention of a great many cases, after having been regulated. In many instances no other retainer need be used. It consists of a little spur or pin projecting from a cavity in one tooth, and resting on the adjacent tooth, thus holding the teeth in position. It is particularly useful in holding a tooth after being rotated, or in holding one or more teeth in line. Many cases have been retained by these spurs alone, without other appliances. I have here the models of a few cases, which I will show.

Nearly all these cases have been regulated by means of Dr. Ainsworth's band. This case has a right central turned a quarter way round, and a right cuspid placed outside of the arch. The irregular teeth are now in good line, and held in position by spurs. Here is another case, which is very much out of line, both as regards the upper and under teeth; the upper ones only have been regulated, and are now held in place by retaining spurs. Here is another case, in which the right cuspid is very much out of line, and the arch contracted. In this case I used the band in connection with the spur as a retainer. This case shows a separation of the front teeth. The under teeth seemed to throw the upper ones out, making a space of about one-sixteenth of an inch between the incisors. This condition was corrected by the use of the band, which threw back the front teeth, both upper and lower. These teeth were retained in position by a wire hook passing around the upper centrals. I do not claim that they will remain in place. There is a cause for the separation of these teeth, and I do not know whether or not there is any remedy for it. I have here a bad case of protruding upper jaw, or a much receding lower one. This case is in my own family, and no one wishes it corrected more than I do. My plan of treatment is to put in place bands on both upper and lower teeth, and spread the arches by tying to the bands all the teeth in front of the molars. Then to take four square nuts, and solder a hook to each, and screw them on to the bands. Elastics are to be slipped over these hooks. The child is to wear the appliance constantly. You will see that the tendency of this arrangement will be to draw the upper jaw back and the lower one out, and so jump the bite. I don't know whether this apparatus will interfere with eating or not. I will try and explain on this model how teeth are retained by spurs. The right central and right lateral are both twisted. The right central was turned to place, and a spur put in the mesial surface of the right lateral, the spur holding the central in place. After twisting the right lateral to place, it was retained by drilling into the distal side of the right lateral, and putting in a spur which rested on the cuspid. Another spur in the mesial surface of the right central rested on the palatal surface of the left central.

*Dr. Andrews.*—Do I understand that these spurs are two little pieces of gold, connected with the band?

*Dr. Baker.*—No. The gold spurs project from the cavity in the tooth, about one-sixteenth of an inch, and rest on an adjacent tooth. They are made by cutting a strip from a piece of thick



plate, and putting it in a port-polisher and working it down to the desired size. To insert the spur, I drill a cavity in the tooth, if there is not one there already, fill the cavity with cement, then insert the pin in cement. These pins will sometimes last a year or two, and there is no inconvenience from their use.

*President Smith.*—Do I understand that you have to drill a hole in a sound tooth in order to secure your spur?

*Dr. Baker.*—Usually a cavity already exists, but if there is none, I do not hesitate to drill one. These cavities can be readily filled again, in such a way that they will not decay. The only precaution to be used is to avoid drilling too near the pulp. I happened to discover these spurs in this way. I had a case some fourteen years ago which required extensive regulating. After the regulating was completed, the question of a retaining appliance presented itself. My patient told me that he would not wear anything which showed. I replied that I did not see how it was possible for me to put anything in which would satisfactorily retain the teeth, and at the same time be out of sight. My patient still held to his point, and as a result of careful study, I thought of these spurs. Although I put in his mouth four or five spurs, in only one case was I obliged to drill into a sound tooth.

*Dr. Andrews.*—How long have you used these spurs?

*Dr. Baker.*—Twelve or fifteen years. I brought the matter before the Massachusetts Dental Society several years ago. I do not claim that this method is original, but I do not know of its having been used. To illustrate the difference between this method and that of retaining plates, I will mention the following case: A patient of mine, whose teeth had been successfully regulated, wore a retaining plate for about six months. I found that the enamel was decidedly affected in the case of the lower teeth, and I came very near having a bad result. I removed the plate in time to prevent serious harm, and became convinced that it was better to have the teeth in their natural condition, with as little as possible in the mouth in contact with them. To my mind, the drilling of a cavity in a sound tooth is far less objectionable than a retaining plate, because the point of contact is much smaller.

*Dr. Ainsworth.*—The apparatus used in the correction of the cases which I present to-night is the same which I brought before the Academy about a year ago, and as to the details of this apparatus, I believe I may claim some originality. It was in use by me two or three years before I brought it before this society. The apparatus is a modification of the Patrick band, from which I failed

to get much satisfaction. After discarding this, I tried a band having its ends soldered to the anchor bands which were about the molars. But the heating of the band necessary to this operation removed its spring temper, a most important quality. In seeking a way to overcome this difficulty, I devised this method. The ends of the band were provided with a thread and nuts, and were allowed to pass through tubes about a quarter of an inch in length, which were soldered to the sides of the anchor bands, these bands being placed upon the molars. Here is a case where the upper front teeth protrude very much, the arch being contracted at the bicuspid space. The lower teeth strike one space too far back. My first step was to spread the upper arch so as to make a fair occlusion when the under teeth were closed one space further forward. After spreading the arch, I put the nuts at the rear ends of the tubes, and drew the front teeth in until the upper arch was in proper shape. I then instructed the patient to project the under jaw in closing the mouth and relied upon her intelligence to accomplish the desired result. In this way the bite was successfully jumped. At first, especially at night, she found it difficult to keep her mouth closed in the new way. In the morning the occlusion would be more natural in the old way. She has entirely overcome that now. Had I used Dr. Baker's spurs on the laterals, they would have been held more positively, but the result is not unsatisfactory as it is. I use German silver for my band, but I know of no objection to using platinized gold. There is no one system of regulating which is invariably better than another. I believe the best system of regulating is that to which the operator is most accustomed. There is comparatively little trouble in moving teeth into proper position, but it is a great problem to hold them there. Here is a case of very prominent upper teeth, and it was very difficult to hold them in place after regulation, because the child did not appreciate what was being done for her.

*Dr. Mead.*—If a plate had been struck up and cemented over the tips of the front teeth, would not that have held them in position?

*Dr. Ainsworth.*—Such a plate would be effective, but also a great disfigurement.

*Dr. Mead.*—I have never had any trouble with this method. Once in a while the plate gets loose, and I replace it.

*Dr. Ainsworth.*—I think there is a great deal of value in the spur of which Dr. Baker speaks. In many cases a cavity already exists in which to insert the spur. I never hesitate, however, to drill one for this purpose. This seems to me a far less evil than to run the

risk of damage from a less positive retaining appliance. Here is the material of which the band is made; it is all German silver. That for the anchor bands is wire rolled down very thin. Here are some seamless German silver tubes, made for me by the Spring Garden Metal Works of Philadelphia.

Here is a model showing a method which I pursue in the treatment of approximal decay in the molars of children. This case came to me with decay between the temporary molars. I cut a V-shaped opening between them, and thereby nearly obliterated the cavity. Seeing that trouble was coming between other temporary molars, I cut a V-shaped cavity between them all. I also caused the mesial surface of the sixth-year molar to be open to friction. This method has given me great satisfaction. In the chair, to-day, I examined the mouth of one of my own children, between whose temporary molars I had ground a V-space. I found that decay had been entirely stopped by the friction to which the teeth had been subjected.

Here is a case not in line with the subject of the evening, but of considerable interest to me. The upper front teeth were worn down nearly to the gum line. The pulps were alive, and so sensitive as to cause much trouble and inconvenience. I crowned all the teeth, using countersunk pin teeth set in firmly-fitting gold bands.

The work was finished a year and a half ago, and the teeth have done good service with nothing whatever to hold them but the band and the cement. One of them worked loose this summer, and I reset it; the others seemed as tight as though they were a part of the tooth itself. I have had occasion to set a number of such crowns upon teeth having live pulps, and always with a great deal of satisfaction.

*Dr. Wilson.*—In the case of Dr. Ainsworth's regulating appliance, I would like to ask, what is to prevent the anchor bands from getting up on to the gums.

*Dr. Ainsworth.*—That is a very important point. I wish to make it clear that the anchor bands are cemented on to the molars. They are of such thin metal that it is not necessary to file between the molars to get room to put them on. A wedge can be placed in both sides of the molar, and in two hours' time there will be room enough to pass this band through. Then I would use a very adhesive cement, and cement the band in place. They will occasionally come off, but not very often.

*Dr. Mead.*—Do you cement your bands and apply your wire at the same sitting?

*Dr. Ainsworth.*—Sometimes I would, and sometimes I would not. I consult my convenience and that of the patient. It is a good plan to cement the bands on one day, and put on the wire the next; in that way, you give the cement sufficient time to become thoroughly set. I do not take pains to make a perfectly fitting anchor band. I intend it shall be too large, so as to have a good body of cement to hold it.

*Dr. Mead.*—On leaving the house this afternoon, I took with me the models of what I call a "bull-dog mouth," and I brought also the appliance which I used in correcting it. I made a simple rubber plate to open the bite, so that the protruding under teeth could slide back within the uppers. By this plate also the lower teeth were brought in by repeated ligations. The upper laterals were brought out by the "McQuillen band," with elastics attached, and it was done in a few days. The whole thing was completed in three months. The models are here before you, along with the appliances used.

*Dr. Brackett.*—One of the difficult teeth to retain in a changed position is a superior lateral which has been prominent, and whose mesial side has been rotated outward. If I rightly understood Dr. Ainsworth, he made the statement that the spur was especially applicable to the retention of these teeth, and that it might always be inserted on the palatal side.

*Dr. Ainsworth.*—That is one of the cases to which it is especially adapted. After the lateral is brought into place, the spur is fastened either into the lateral itself or a cuspid, either or both.

*Dr. Wilson.*—In such a case, you would put two spurs in?

*Dr. Ainsworth.*—I would use one or two, as the case seemed to require.

*Dr. Mead.*—In cases where the teeth have been drawn back very far, after getting them into position, I usually strike up a metal cap, about one-third the length of the teeth, and that holds them firm and fast.

*Dr. Andrews.*—I can speak well of the spur. I have used it for twelve or fifteen years. Dr. Cutler calls a case to my mind where I used it seven or eight years ago. My method was to drill a cavity in the tooth slightly smaller than the screw I was to use. I then dipped its end in sandarac varnish, and screwed it into place. You would be surprised to see some of these screws that were put in long ago; they have been allowed to remain, and no decay has taken place around them. I think the spurs were put in to hold back laterals which had been prominent—just such a case

as Dr. Brackett speaks of. I drilled into the lateral, the gold screw was screwed into the hole, and the end rested against the cuspid. These spurs that Dr. Baker has shown seem to be in both teeth; I use them only in one tooth, and I always place them so that they are not in the way of articulation. I may have been indebted to Dr. Baker for the idea, for we have often exchanged views on such subjects.

However, I should be loath to drill into a sound tooth for the purpose of putting in a spur. It might not do any harm, but if we don't do it, we are certainly not running any risk.

To my mind, for a retaining apparatus to be used on the anterior teeth, there is nothing so valuable as a band, with little prongs on either side. I recently saw a case which was under the care of a New York dentist, and there were six of these prongs, holding the regulated teeth in position, and holding them well.

*Dr. Ainsworth.*—There are a great many cases where the patient objects to anything that is conspicuous—anything that shows at all in the front of the mouth—and I think in such cases the spurs are a very great advantage. They can be worn for years, entirely concealed, and without any discomfort to the patient. I think in two-thirds of the cases where we want to use one we will find a cavity already existing. I should never hesitate to drill a cavity on the inside of a tooth, where it is out of sight, and can be perfectly cared for after we get through with the spur.

I make a point, when regulating, of carrying a tooth a little farther than I wish to have it remain, trusting that when the spur is removed, the tooth will naturally drop back a little.

I would say further, in regard to this regulating band and the ligatures, it is possible to produce a very great deal of suffering in tying up teeth or wedging teeth, and it is necessary to use a great deal of caution. There are a great many different ways in which a tooth can be tied up, and I venture to say that there are very few cases which cannot be tied in a positive way so that the ligature will not slide up under the gum, and produce unnecessary pain.

WILLIAM H. POTTER, D.M.D.,

*Editor American Academy of Dental Science.*



## ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

At a meeting of the Society, held at 1228 Walnut Street, the President, Dr. E. T. Darby, in the chair.

After the transaction of routine business, Dr. S. G. Perry, of New York, read a paper upon the proper care of the teeth to the fifteenth year.

(For Dr. Perry's paper, see page 148.)

## DISCUSSION.

*Dr. Jarvie, New York.*—This is a case in which the last shall be first, for I was the last comer, and, unfortunately, I was not in the room when Dr. Perry commenced his paper, and so did not hear all of it; but it is a most interesting question, and has been ably treated. It is a subject that does not receive the consideration it deserves. I think we should so treat the teeth of children that at middle age they will have a good, wholesome set of teeth, and to accomplish such a result requires good judgment. The paper stated that observing and directing the development of a set of teeth was perhaps, one of the most interesting things that occurs in the dentist's professional career. That has been my experience, and, in deciding upon the management of a child's teeth in any given case I have always had in view the condition I hoped to have them in when the patient should attain middle age.

To accomplish a desirable result, we are sometimes embarrassed by the parents, whom it is desirable to be made to understand why we use materials to fill the teeth of their children which are necessarily temporary in their character, and which must be renewed from time to time, rather than to use gold, which many have an idea is the best filling-material for all teeth, and which, once inserted, ought to last forever. All teeth of young children, and those of delicate organization not young, ought almost invariably to be filled with the plastics or with tin, and such fillings must frequently be added to or replaced as circumstances demand. Gutta-percha, oxyphosphate of zinc, and tin are by far the best substances to use, yet I should be very sorry to be without one filling-material that has been severely denounced by the essayist, and that is copper amalgam. I have had one or two experiences such as Dr. Perry related, and have seen many others; but I still think copper amalgam is very valuable as one of our filling-materials.

There are certain classes of children's teeth—I mean quite young

children, in which we can save the temporary molars for a few years by the use of that material—that we cannot save in any other way. I have one or two cases in mind,—a child three and a half years of age was brought to me with the worst teeth I have ever seen in a child,—one of the most healthy and vigorous-looking, yet at this age not a sound tooth. The superior incisors, all four of them, were broken off. The gums were healthy, but the teeth had become exceedingly sensitive, so much so that the child masticated food with difficulty, and the condition was becoming serious. I removed the decay in the molars as well as I could, yet imperfectly, keeping the cavities as dry as possible without the rubber dam, as I could not apply that, and saturated the surfaces with carbolic acid for a few minutes. Then I filled with copper amalgam, and it seemed to have apparently some adhesive property, for it remained where I had hardly dared expect it to.

Another case was somewhat similar,—the child five or six years of age and the temporary molars in the same condition. This last case was treated about two years ago, and I see the child frequently, and the fillings remain good, very much better than I had any idea they would when I tried it, for I used it largely as an experiment. The child, from masticating with difficulty and pain, found she could masticate with comfort, and the relief seemed marvellous to her. I am the best friend she has, and she comes to me with delight. I do not think I could have accomplished the same result with any other material than copper amalgam. I use it frequently in temporary teeth, and it serves a purpose accomplished by no other material.

I want to emphasize all that the essayist said in regard to the use of tin-foil in the fissures of the temporary molars, but more particularly, perhaps, in the sixth-year molars. I think it is by all odds the most valuable material we have for such cases. The fissures can be readily removed, where the decay has not progressed to any great extent, and easily filled with tin-foil. I use No. 3. It works almost as plastic and is almost as readily applied as amalgam. I had the pleasure of seeing some block tin prepared by your president the other night which had a quality I had never seen before. It was soft, yet cohesive, and was in the form of shavings, and will undoubtedly prove of value.

*Dr. Hall, of China.*—I am fully conscious of the fact that you will attach more importance to the unique place of my residence than you will to anything I might say to you upon the subject of the paper that has been read.

Though the paper stopped at the fifteenth year and assumed the care of the teeth to that time, it seems to me that Dr. Perry has touched about every point that constitutes the perfect salvation of the temporary and permanent teeth, for, having carried the patient up to the fifteenth year with such treatment as he describes the permanent teeth are perfectly safe. The discussion of the material that enters into the care of the teeth of young or old is, I believe, of minor importance compared with the true welfare of the patient. The wish to keep the teeth as Nature meant they should be kept is evidenced in every line of his paper. That which the artist used in mixing his colors applies most fitly to everything that the dentist does in the care of the teeth. And whilst I am distinctly in favor of certain facts of detail and the wisdom of deciding upon certain things as facts from which we may not depart at all except in the line of experimentation, I am still willing to believe that great laxity is permissible in the choice of materials, from copper amalgam to gutta-percha, or anything else. We all know that Dr. Perry is not in the habit of presenting in his practice or before societies anything that is not of the very best. I feel very much pleased that I have been here, and I am more than flattered to think that, after an absence of more than fifteen years from the profession, I can truthfully say that I have, in a large measure, had the pleasure of agreeing with Dr. Perry in his methods and most of the points that he has brought out to-night, and it gives me a great deal of satisfaction to find myself fairly in line with those who are older and banded together in this country for that which is the very best in the preservation of the teeth.

Dr. Woodward expressed himself as much pleased with the paper, having come from New York to listen to Dr. Perry's views on this important topic.

*Dr. Truman.*—Dr. Perry's paper is entirely in accord with my own views in regard to this subject, and are those I have held for the last twenty or twenty-five years. Years ago, when discussing the question of the treatment of children's teeth, I felt myself practically alone when advancing the same ideas that Dr. Perry has formulated to you so thoroughly to-night.

I, however, go further than he does in this matter, for I am almost prepared to assert that it is malpractice for any individual to place gold fillings in children's teeth from eleven to sixteen years of age. I know that is a strong statement, and perhaps I should qualify it to some extent by the assertion that some teeth will bear it; but we cannot reason upon exceptional teeth. The teeth that



are sufficiently dense at that age to bear such fillings are extremely few.

What is the philosophy of this? You all comprehend the fact that a tooth at this age of life is not fully developed. That all the tubuli, histologically speaking, are very much larger than they will be at a later period; and if you place a good conductor in the teeth, as gold, irritation will be produced, and the irritation upon the peripheral ends of the tubes will be carried to the pulp, producing inflammation and final destruction. If this be the case (and I cannot see that it is possible for any one to deny it, knowing the minute anatomy of the tooth-structure), are we justified in ever using gold in that class of teeth? I have, therefore, declined to use gold up to the twentieth year, except in rare cases, notwithstanding the frequent objection of parents. If parents are permitted to dictate to us, we have mistaken our calling. I have had some such difficulty, but I always say, You must accept my word in the matter or it would be better to take the child elsewhere. This I regard as the only course to pursue in these cases until greater density is secured. The expression that "whatever tooth was worth filling was worth filling with gold" has lost its force, and we are coming down to a philosophical method of treating teeth,—not alone those of children, but all teeth.

Dr. Perry seems inclined to fill the canals of deciduous teeth occasionally. I should say, never fill them. I do not see the necessity for this operation. If a proper antiseptic be used, it will be all that is required. [Dr. Perry here stated that Dr. Truman had misunderstood him, that he did not state that he filled temporary tooth roots.]

Dr. Truman explained that he so understood it and was gratified to know he was in error.

*Dr. Faught.*—But one idea has entered my mind while listening to this discussion to which I would like to give expression. We have heard the old story often repeated. Men of unquestioned integrity and observation tell us one thing, and men of equal integrity and observation and learning tell us another thing. The question ever is, What is accepted practice? We find out, after all, that the latitude as to how to care for the teeth to the fifteenth year is not a fixed quantity. That it is not malpractice to do certain things we have had very plainly exemplified here to-night; but it is very desirable to arrive at definite methods of treating teeth. Dentistry can never become the fixed thing it should be in the eyes of the public until that time. Here is full reason why it is so diffi-

cult to get our patients to understand that a filling once put in a tooth will not preserve that tooth forever, and the reason why we find it so hard to make parents understand why we use plastic fillings instead of gold up to a certain age. Our patients go out from us and rub against each other and find that the majority of men in dentistry are not a unit in the matter, and they get down to the conclusion that gold must be used in all cases, and they come to us with a determined effort that will make it difficult to care for the children at this age.

*Dr. Jefferis.*—Dr. Perry started out by giving us what we were to hear,—his own views, and not a dogmatic expression of the views of others. If I have any difference with him it is in the use of amalgam. I use amalgam with a small percentage of copper in it,—not the copper amalgam as ordinarily understood. Also in the use of pink gutta-percha on the approximal surfaces of the temporary molars where they are decayed. In making a filling between these teeth I frequently use it, and find that it answers the purpose not only in arresting the decay, but in protecting the gum from the impact of food between the teeth, which separate hard fillings will not do. The teeth naturally fall apart as the jaw grows to accommodate the larger second teeth, and if the space is filled between the teeth when decayed with the pink gutta-percha, it will protect the gum while arresting decay of the teeth. And further, when the molars are devitalized, while I extract the pulp as well as may be, I place a disk over the pulp cavity and fill the cavity in crown only, in every case drilling a vent at the cervical buccal margins.

*Dr. Boice.*—I use gutta-percha and tin, and very little oxyphosphoric acid; but my principal difficulty is in getting good gutta-percha. I once made a statement at the Pennsylvania State Society that I would give a hundred dollars for an ounce of good gutta-percha. I believe I would now give a hundred dollars for an ounce of the same material.

*Dr. Bonwill.*—It is with pleasure I greet such practical men as the essayist, Dr. Perry. His suggestions are from honest convictions of sight. He is an enthusiast in his profession and desires our consideration, and his teachings are generally good,—very good. He is a safe operator to follow, and while we differ on some matters, yet I can say in sincerity, follow him. Think for yourself at the same time, let be said what may and from whomsoever it may come.

*Dr. McQuillen.*—Dr. Perry mentioned the difficulty in satisfying parents. I think we should follow our own conscience in what

do and not allow them to enter into a discussion. When I say I am going to fill a tooth with a certain thing there is no discussion. It goes in.

*Dr. Bassett.*—It seems to me the paper is very exhaustive. I have followed Dr. Perry's ideas closely in my own practice. In regard to the treatment of teeth by the use of plastics before the fifteenth year, I may go further and say with Dr. Truman that I consider the use of plastics, of the kind mentioned, necessary until the teeth are thoroughly solidified, in spite of the protests of parents who consider that a tooth once filled should be always filled, and that gold is the only filling to use. I must continue to use gutta-percha where I think it is of the best to preserve the teeth from decay which are below the average in quality, and withholding the use of gold and other hard materials until the teeth are thoroughly solidified.

*Dr. Roberts.*—I endorse Dr. Perry's statement. Copper amalgam I have no use for; it is too treacherous, and also leads to the destruction of the teeth even after the crowns are gone.

Dr. Peirce said he thought the paper was overflowing with good common sense.

*Dr. Milliken.*—The gentleman from Shanghai, Dr. Hall, said it was an excellent paper and covered all the points. I fully agree with him as far as the paper goes, but I do not think it has gone far enough. I think as a profession we are apt to confine ourselves to filling-materials, which I regard as a mistake. When patients come to us we should quietly take them in; not financially, but physically. We should make strict inquiries into their mode of life, especially if they be young, and as we go on from month to month, watch to see if there is any change in their health. I think if we made a practice of it we could recognize any changes in their condition which could be corrected by calling their own or their parents' attention to it. Very few of us ever think of such a thing as inquiring how many hours a day the patient spends in the school-house, and how many hours in the open air; what they eat and drink and how many hours they sleep; whether the sleep be sweet and restful or disturbed and restless. Such things do not seem to cross our minds. As an instance of that, I had a little patient who has been in the habit of coming about every three months (a pretty, healthy-looking child). She had never been afraid of me, and I had always managed to get along nicely with her. I noticed when she came two months ago that she was nervous and fidgety, and the moment I took up my mouth mirror she

nervously asked me what I was going to do. The question surprised me. I inquired if she slept well, if her appetite was good etc.; she replied, "Yes." Upon questioning, I found that she didn't go out to play in the air much, and I sent her away and told her to tell her mother to come to see me. The mother came the next day, and I asked her if she was aware that her child was running down. She was surprised and answered, "No!" She said the child did not sleep well, but was restless and dreamed a great deal, and that her appetite had not been good for several months. I suggested that she consult her physician, and advised that the child be taken from school and sent away or kept in the open air for a month or so. She took my advice, keeping the child away from school for about a month, and it was wonderful what a change took place, not only in her mouth, but also in her general health.

I think that the best way to preserve both the temporary and permanent teeth is to preserve the general health, a plan that has not been adopted, unfortunately, in our profession. It seems to be a subject never, or very seldom, given a thought.

The President introduced Dr. Crouse, who on behalf of the Dental Protective Association solicited the members to take shares of stock in order to raise one hundred thousand dollars, with which to equip a manufactory for making dental appliances. The shares being those of an incorporated association created under the laws of the State of Illinois.

Adjourned.

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## Editorial.

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### MEDICAL CRITICISM.

UPON another page of the present number we quote an editorial from the *New York Medical Record*. This is a very peculiar criticism of the dental profession, under the title of "The Defect in the Dentist." Ordinarily, the best answer to unjust charges is silence, permitting time to show that misstatements, however plausible, have only a limited life, and that eventually truth secures its rightful place.

Dentists have been so long accustomed to this kind of profes-

sional criticism that they have come to regard it very much as the chiding of a parent, a proper thing to give and to be received with all due humility.

It seems to us, however, that the time is past for quiet submission to this parental guidance and assumption of superiority.

Dentistry had its origin in the necessities of humanity. Medicine ignored it as part of its work. The world for uncounted centuries was left the victim of ignorance and to suffer untold agonies of misery, while this paragon of the healing art looked on and did nothing. It strenuously regarded the oral cavity as of no special importance in the treatment of disease. It seemingly held that the mouth and its appendages was simply an incident in the anatomy of the human body and unworthy the consideration of a dignified body of men such as the medical faculty of the world claimed for themselves. It practically refused to recognize that the teeth bore any direct relation to other organs of the body, or that more careful study of pathological conditions would be of any benefit to general medicine.

That there were honorable exceptions to this is admitted, yet the influence of John Hunter and the few who followed him with interest in the subject of odontology was so limited that it was not until the last half of the present century that medical practitioners began to appreciate the importance of attention to the intimate relations existing between the mouth and its connections, and it has only been in the last twenty years that they have deigned to treat the dentist with any evidence of respect or to accord him a position as one of the workers in the healing art.

This antagonizing influence forced the dentists of the earlier period to work apart from the medical fraternity and to build a distinct profession. It was a slow, laborious effort. The practical claimed first the attention of the laborers in this field. In this they had but little assistance from the older profession; on the contrary, they were regarded with thinly disguised contempt.

The time came when dentists organized their own schools of instruction, and slowly but steadily added branches of study until these schools began to assume a character that led medical practitioners to wonder, and from wondering to act. It became clearly evident to the belated understanding of this body that this young aspirant meant progress in every line of its work, and that sooner or later it would occupy a position worthy the respect of the world, whether it was recognized or not by professedly higher authority. It was further found that the schools established were becoming

centres of attraction to young men who quickly recognized in their work a new source of profitable and intelligent employment.

The conservative medical element still regarded these evidences with disfavor, and persisted in believing these to be the vain efforts of a race of mechanics endeavoring to become semi-professional men. The younger element, though prejudiced by the elders, began to view this uprising in a different light, and while they reluctantly gave the right hand of fellowship, they could not disguise the fact that dentistry had made its place in science, and it was their duty as well as to their pecuniary interest to patronize it with limitations. The result has finally been that there is union everywhere with medical colleges and universities. Even conservative Europe has been obliged to make concessions to the spirit of progress and add to the great universities dental institutes. At present, therefore, there need be no question as to the position occupied by the modern dental operator.

It is to the credit of this young profession that it has never asked for recognition from the elder organization; in fact, it has rather resented any attempt to absorb it into the great body, feeling, very justly, that while there was much in common, medicine and dentistry must ever remain distinct in their organizations, and largely so in their work.

While this is true, it does not mean antagonism, but, on the contrary, entire harmony where the two professions meet on common ground, but entire independence in all other relations.

It is very late in the nineteenth century for an editor of a medical journal to feel it his duty to issue the screed quoted and to say, as he does in that editorial, that "The dentists of America are the best in the world, but they are, nevertheless, away behind the mark. We appreciate their ingenuity, their skill, their drills and dams, their composite fillings, and artificial teeth. They make the best kind of golden crowns, but do not deserve to wear them. This is because they do not sterilize themselves, or teach their patients how to prevent caries. They are wonderful patchers-up of things half gone, but they do not show us how to prevent the going."

It is true that dentistry does not yet "deserve to wear the crown," but not for the reasons stated. It has grown rapidly in the brief period of perhaps one hundred and fifty years, and is nearer that high position, or, to state it better, is based more nearly on scientific lines, than medicine in its centuries of work. In that time it has quite thoroughly explored its limited field, but has never yet worn the collar of subserviency to authority which has held

medicine in bonds to an extent that progress has been almost an impossibility until a comparatively recent period. Change came with additional light thrown upon the origin of disease through bacteriological investigations, but previous to this time, barely two decades, medicine practically lived on the teachings of the past, and wore its collar with amazing equanimity.

While medicine was asking, with bated breath, what changes the theory of the germ origin of disease was likely to produce, if perchance it should be proved true, dentists of intelligence were adapting themselves to the new conditions, and before medical men had come to realize the importance of these new ideas, had adopted them in practice and had demonstrated that their only hope of success in the treatment of pathological conditions was through antisepsis. Yet our critic boldly charges that "they do not sterilize themselves," and, by inference, would lead us to believe that medical men universally are careful in this respect. That there is too much carelessness in both departments is without doubt true, but it is not true of the better elements of either medicine or dentistry.

The truth is, that the importance of sterilization is not as yet fully appreciated as it should be. It is no unusual thing to find the medical attendant making no attempt to sterilize his hands in his daily rounds, and we have seen the temperature taken by the mouth, the thermometer simply rinsed in water, and replaced in its case, to be used on some other patient. That this is common we do not believe, but it exists, and illustrates the fact that dental carelessness is not exceptional.

Further our critic says, "There is hardly a dentist (there are a few) who works in an aseptic way or uses aseptic instruments." The great importance of rendering instruments aseptic is as thoroughly understood in dentistry as it is supposed to be in medicine, and no dentist of any character would dare to practise without using every precaution available. There are many difficulties in the way of doing this thoroughly, and these have not been entirely surmounted. The instruments can be rendered harmless, but the hands cannot be treated in the same way, or be considered aseptic in the best meaning of that term. We have great faith in thorough cleanliness, which can be accomplished by a free use of soap and water.

Our critic forgets, perhaps, that some of the best surgeons regard cleanliness as the true antiseptic, for they argue that a germicide sufficiently powerful to destroy pathogenic germs will destroy

equally the tissue on which it is placed. Hence all that can be hoped for, as far as dentists hands are concerned, is to render them incapable of harm, and this can be accomplished by inhibiting the development of pathogenic bacteria.

Our critic lays great stress on the fact that dentists do not show patients "how to prevent caries." Is he aware that this disease of the teeth is the result of fermentation through microbic action? Is he further aware that caries is dependent on many factors which no amount of care or instruction to patients will prevent? It is not probable that he knows anything about it, and hence ignorantly assumes that the dentist can accomplish an impossibility. The most that can be done is to minimize destruction. His idea of what is needed to accomplish this desirable result is good as far as it goes and it is true that "an antiseptic wash is needed" in every case but will this make chalky teeth dense, or hinder the impaction of food on impinging surfaces, or prevent patients from eating all sorts of injurious foods, or prevent the medical attendant from ordering acid remedies without any attention to neutralization, or will it indicate to the same learned caretaker of the health of the people that sanitary attention to the mouth is an important consideration in cases of long-continued fever. If these and more are mastered he will, possibly, come to realize that caries cannot be prevented absolutely, and that the prophylactic treatment to this end has never yet been devised and, probably, never will be.

In return for his kindly suggestion, we would ask him to remember, using his own language, "that the mouth is a rich culture-ground for microbes," and that to secure, in a measure, immunity from many diseases it would be well to pay some attention to inhibiting the development of pathogenic bacteria there and in the nasal tract, and thus prevent them from reaching vital organs. It has long been our opinion that medical men are grossly negligent of duty in this respect, especially where contagion is to be feared. They will talk learnedly of sterilization of hands and instruments, yet never a word in regard to "this rich culture-ground," the poison manufactory, so to speak, for the entire system. They will sterilize the excreta with a persistence worthy of honorable mention, but they allow the development of death-dealing germs in the mouth to proceed unheeded. Why, may we ask, has medicine so long neglected this opportunity to meet disease at its inception?

The period of criticism of this kind has passed. Dentistry has come as one of the great needs of humanity. It has been developed beyond the stage of mechanism into the region of scientific



acquirement, in no degree inferior to that possessed by others. Whether it will be absorbed in medicine, as some think, or remain an independent profession, as we view it, it holds, and will continue to maintain, a position equal to that to which our critic belongs, in thoroughness of manipulation, in effectiveness of treatment, and in excellence in results within its range of work.

Its management of the oral cavity in every direction has increased the tenure of human life and has almost obliterated the feebleness of three score years and ten. It has promoted and continued the digestive functions unimpaired far beyond former periods, and by maintaining a more perfect balance of health has preserved mental vigor. In a word, old age has almost ceased, through its intelligent skill, to have the terrors formerly anticipated. The truth of this record cannot be controverted, and upon this we rest as sufficient for our honor, and in the development of which medicine has had no part.

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#### PYORRHOEA ALVEOLARIS.

It will be evident to the readers of the present number that Professor Peirce's paper on this subject, published in the January issue of this journal, has created a wide interest. It is not surprising that it has elicited a diversity of opinion, for from the character of the paper this was to be expected. We devote a large portion of our space in this number to this subject as viewed by various minds, and while the results may not equal the expenditure of words, the effect must be to force to a more exact examination of this difficult pathological problem.

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#### PROFESSOR W. D. MILLER.

PROFESSOR MILLER has been made a professor in the medical faculty of the University of Berlin. Very few, we imagine, not familiar with German habit of thought and practice, can appreciate what this means. Aside from the fact that he is the first American to fill such a position, he is also the first dentist to reach such a place (German or otherwise). The fact that he had not followed the usual course regarded as indispensable in Germany to make him eligible for the honor renders it, perhaps, one of the most remark-

able appointments of modern times. It is also an honor to the University that it is willing to recognize ability, such as Professor Miller possesses, and has demonstrated a power to override national prejudice and long-cherished customs.

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## Bibliography.

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CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY FOR 1893. B. B. Catching, D.D.S., Editor and Publisher. Atlanta, Ga., 1894.

This compendium of practical dentistry is presented to the dental reading public with a promptness to be commended. It contains, as heretofore, abstracts from all the most valuable papers presented on this side of the ocean, with a few from other countries.

This is a marked improvement over previous issues, and we are pleased to notice the editor appreciated the suggestion made in regard to this in the review made by this journal of the issue for 1892. The editor promises an enlarged outlook for that of 1894 for he says in his preface, "In this issue the condensed practical results of the dental journals of six different nations are given. The next (1894) edition will contain the practical results of the dental journals of the world. An editor and translator for each language in which a journal is published will give, in condensed style, the work of each country. . . . The proposed cosmopolitan character of the work is begun in this issue by the assistance of able editors and translators of the German, French, and Italian. W. D. Miller, M.D., D.D.S., of Berlin, A. C. Hugenschmidt, M.D., D.D.S., of Paris, and Wm. Dunn, D.D.S., of Florence," will act in this capacity.

The amount of labor required to make a book of this kind satisfactory both to writers and readers can hardly be appreciated by those not familiar with the work of selecting and condensing from the immense amount of material yearly put forth. While in many respects the subject matter is not of the highest scientific order, it is an excellent *résumé* of the work of the year. The fault, if fault it be, lies not with the editor, but with writers on dental topics. There is too much of an effort in all the proceedings of dental societies to make a lengthy essay, without much regard to scientific accuracy of statement. Perhaps there is no better way of exhibiting this than

a book of this kind. It enables us to gauge our shortcomings. It has, however, a higher object, and this makes it especially valuable to the busy dentist, in that he has a synopsis of the yearly work for ready reference. In this respect this compendium becomes a necessity in the operating-room, laboratory, and at the desk.

It is to be regretted that the editor has taken the responsibility of changing the titles of some of the papers from which he has taken abstracts. Especially is this noticeable in those on pyorrhœa alveolaris. It is no improvement to head all these "Riggs's Disease." The dental profession has long since condemned the use of this name, and it should not appear as descriptive of a pathological condition at this stage of the investigation of this difficult subject.

The editor has performed an excellent work in giving this compendium to the profession, and the extension world-wide will add not only to its value, but to its interest. It is a satisfaction to know that it "has passed the experimental stage," and it is to be hoped the demand for it will grow with each succeeding year.

**POPULAR ESSAYS UPON THE CARE OF THE TEETH AND MOUTH.** By Victor C. Bell, A.B., D.D.S., Director of the Special Prosthetic Department of the New York College of Dentistry, Late Dental Surgeon to the German Polyclinic. Published by the Author, 1894.

Perhaps one of the greatest difficulties met with in dentistry has been the ignorance of the general public, both in regard to personal care of teeth as well as the value of dental services. A half-century ago this was the chief stumbling-block in the practice of that period, for at that time, the majority of persons had no higher conception of a dentist's duty than as a "puller of teeth," and it is therefore not surprising that dental services then were mainly confined to this.

Since that period a great change has been effected, but so much is still to be desired in this direction that any effort made to enlighten the general public must be received with pleasure. Hence Dr. Bell's effort is one of the most satisfactory of any in this direction.

He has stated in his preface a great truth, when he says, "Were the information contained in this little book generally diffused, and its teachings well followed, not only would very much pain and suffering be prevented, but the general term of human life would be perceptibly lengthened."

The author devotes the one hundred and two pages of the to general instruction, arranged in a series of essays, free technicalities and well adapted to popular comprehension.

There are necessarily many difficulties in the preparation of such a volume, and the author has probably found this to be the case in many of the essays. It is a question whether he had not better have omitted altogether "Hints on Home Remedies," not but that it contains excellent suggestions, but that it is questionable whether patients are, as a rule, capable of carrying these out. For an untrained person to make a correct diagnosis of toothache, in its protean forms, seems to be an impossibility. In illustrating this, in describing the treatment of "Aching Teeth when the Pulp is Dead," the author gives this advice: "Rub iodine and aconite, in equal parts, around the gums with cotton or a camel hair brush. . . . The iodine and aconite induce a healthy flow of blood, and facilitate the removal of waste material." Aside from the difficulty of the patient comprehending when this should be used, or to differentiate between pericementitis and pulpitis, there is a wrong committed in advising the patient to use an agent as dangerous as aconite. This should never go out of the office, and it requires a full comprehension of its toxic properties to be able to use it there. Aside from this, it is, in the opinion of the reviewer, a less remedy when applied topically to reduce inflammation, as it paralyzes the sensory nerves and produces torpidity where the greatest amount of activity is required, if counter-irritation is to be of any avail in reducing the congestion at the focus of inflammation.

The author still adheres to the idea that lime-water taken internally will harden teeth. It seems useless to contend this point, but assimilation and nutrition do not proceed from inorganic material.

The book, as a whole, can be cordially commended, and if it could be placed, in a cheap form, in dentists' hands, it would unquestionably be productive of a vast amount of good. It is probable, unless given away, it will reach to any large extent the for whom it is written, as the general public are not yet sufficiently well educated, it is feared, to appreciate the importance of dental subjects by investing in this character of literature.

## Notes and Comments.<sup>1</sup>

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**THE MICRO-ORGANISMS OF THE HUMAN MOUTH.**—We have received a copy of an essay upon the relationship of micro-organisms to dental caries. The address was delivered by Professor Albert P. Brubaker before the Woman's Dental Association; this subject is one of much importance to dentistry, and the reading of the paper—being illustrated with culture-tubes, microscopic preparations, diagrams, etc.—was of unusual interest.

Of course the credit of solving the problem of dental caries belongs to Professor Miller, of Berlin, and it is a cause for congratulation that we have among us such able teachers and men capable of so much valuable and original work. It is also gratifying that this line of investigation and demonstration is being carried on by other members of our own household.

We congratulate the Woman's Dental Association upon having the subject so ably presented. It is desirable and essential for every dental practitioner to make himself or herself familiar with the study in order to achieve successful results in dental therapeutics as measured by the advance standards.

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## Current News.

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### DENTAL SOCIETY OF THE STATE OF NEW YORK.

**THE Twenty-sixth Annual Meeting** of the above Society will be held in the Y. M. C. A. Building, Albany, on the 9th and 10th of May next, at which time essays will be presented by S. H. Guilford, D.D.S., Ph.G., of Philadelphia, on "Crown- and Bridge-Work: A Protest against Some of its Abuses;" J. Allen Osmun, M.D.S., of

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<sup>1</sup> The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 212 South Fifteenth Street, Philadelphia.

Newark, N. J., "Can Pyorrhoæa be cured?" W. J. Turner, M.D.D.S., of Brooklyn, "The Use of Peroxide of Sodium as recommended by Dr. E. C. Kirk;" R. M. Sanger, D.D.S., of East Orange, N. J.

A cordial invitation is extended to the profession.

F. T. VAN WOERT, Brooklyn, N. Y.,  
*President*

C. S. BUTLER, Buffalo, N. Y.,  
*Secretary*

## ANNUAL MEETING OF HARVARD ODONTOLOGICAL SOCIETY.

THE Sixteenth Annual Meeting of the Harvard Odontological Society was held at Young's Hotel, Boston, Saturday, February 1, at 5.30 P.M., the President, Dr. Forrest G. Eddy, in the chair.

The Recording and Corresponding Secretaries, Treasurer, and Editor read their annual reports, which were accepted. The Recording Secretary stated that during the year twelve papers had been read before the Society, and that at every meeting since two, members had presented for inspection specimens or models of the line of dentistry.

Among the guests present at the dinner were Hon. George Marden, Lowell, Mass.; Hon. Charles H. George, postmaster, Providence, R. I.; Rev. Charles G. Ames, Boston; Louis A. Brandeis, LL.B., Boston; Hon. William F. Sawyer, president Massachusetts College of Pharmacy; Rev. Alexander McKenzie, D.D., Cambridge, Mass.; Hon. Henry H. Sprague, Boston; Rev. F. W. Merriam, Boston; G. A. Leland, M.D., Boston. His Excellency, Governor Greenhalge, was unable to be present, but the State was represented by Adjutant-General Dalton.

The orator of the evening was George F. Grant, D.M.D., Boston, who spoke on "The Development of Our Profession." He contrasted dentistry of to-day with that of twenty-five years ago, and showed that, although it had attained marvellous growth, it still lacked development, there being numberless channels, at present comparatively unexplored, in which the investigator could work. He said that dentistry as a profession is unattractive to the world at large. Most professions have access to the public through the magazines of the day, but ours has not; it is not advertised in the way. What we most need is to attract to our ranks men of worth; we should get in the "best blood."

The speeches of the guests were entertaining and full of encouragement.

The following-named officers were elected for the ensuing year: President, Forrest G. Eddy, D.M.D., Providence, R. I.; Recording Secretary, Waldo E. Boardman, D.M.D., Boston; Corresponding Secretary, James Shepherd, D.M.D., Boston; Treasurer, Dwight M. Clapp, D.M.D., Boston; Editor, Henry L. Upham, D.M.D., Boston.

*Executive Committee.*—Waldo E. Boardman, D.M.D., Boston; Jere E. Stanton, M.D., D.M.D., Boston; A. H. Stoddard, D.M.D., Boston. W. P. Cooke, D.M.D., Boston, was elected orator for 1895.

JAMES SHEPHERD,

*Corresponding Secretary.*

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### THE TRANSACTIONS OF THE WORLD'S COLUMBIAN DENTAL CONGRESS.

THE Transactions are now nearly ready for the final proof-reading; it is therefore very desirable that those who want extra copies, and those who would like to subscribe for them, do so at once, as it is the intention of the committee of publication to print only a sufficient number of copies to supply the members of the Congress and those who have subscribed for them. The subscription price is ten dollars.

Subscriptions should be sent to Dr. John S. Marshall, Treasurer, 1003 Venetian Building, Chicago, Ill.

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### CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the annual meeting of the Central Dental Association of Northern New Jersey, held in Newark on the evening of February 19, 1894, the following officers were elected for the ensuing year:

President, Dr. Thomas Moore, Paterson; Vice-President, Dr. William P. Richards, Orange; Secretary, Dr. William L. Fish, Newark; Treasurer, Dr. Charles A. Meeker.

*Executive Committee.*—Dr. Geo. E. Adams, South Orange; Dr. Oscar Adelberg, Elizabeth; Dr. Fred. A. Barlow, Jersey City; Dr. Walter Woolsey, Elizabeth; Dr. William E. Linsted, New Brunswick.

WILLIAM L. FISH,

*Secretary.*

## Selections.

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### THE DEFECT IN THE DENTIST.

THE dentists of America are the best in the world, but they are, nevertheless, away behind the mark. We appreciate their ingenuity, their skill, their drills and dams, their composite fillings, and artificial teeth. They make the best kind of golden crowns, but do not deserve to wear them. This is because they do not sterilize themselves, or teach their patients how to prevent caries. They are wonderful patchers-up of things half gone, but they do not show how to prevent the going.

There is hardly a dentist (there are a few) who works in an aseptic way or uses aseptic instruments. Some do not know any better, some do not think it necessary. But both are wrong; the one class should learn, the other class should think. How many dentists can tell surely when they are dealing with a syphilitic mouth? Yet if such a mouth is being treated, we do not believe that any one would like to be the next patient, though the dentist should first wash his hands.

The mouth is a rich culture-ground for microbes, and caries, it is taught, is a microbic disease. Yet the dentist is content to fill the teeth, then disburse a bottle of his own special mixture of chalk, orris, and wintergreen, and tell his patient to brush the teeth *vis die*. The ordinary tooth brushing is entirely ineffective in preventing caries or disinfecting the mouth. For this purpose, a genuinely antiseptic wash is needed, and this should be used for a considerable time. Just what this wash in powder should be, and just how long it should be used, is one of the things the dentist should find out. Let the American dentist devise a way of making the teeth and gums aseptic, and preventing caries. He will then be greater than if he had invented a new filling or a novel drill, or transplanted a whole jaw-full of teeth.—*New York Medical Record*.



# THE International Dental Journal.

VOL. XV.

MAY, 1894.

No. 5.

## Original Communications.<sup>1</sup>

### SOME OF THE CAUSES OF DETERIORATION OF VITAL ENERGIES OF DENTISTS.

BY J. N. FARRAR, M.D., D.D.S., NEW YORK CITY.

WHY dentists break down in health and fail to hold their ambition is becoming a serious question in the profession. The indoor life necessary to full practice tends to reduction of stamina throughout the entire system, a condition that would not take place from an open-air occupation, such as that of the physician. Especially is this true of the dentist who stands over a badly-formed chair, in a north light, deprived of direct sunlight from morning until evening. He becomes fatigued from long standing and pale from the same cause that makes a plant lose its proper hue when kept in shade. Fatigue, even from moderate work, will result from the weakness caused by a life in shade, and loss of interest in business is the consequence of the fatigue. But, like a horse in a tread-mill, the dentist in "full practice" knows no rest, nor does he feel real enjoyment. Whether well or unwell, he must work on, day after day, month after month, year after year.

If dentists who have no natural weakness in their systems

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<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

feel the effect of these strains, those who have tendencies to physical defects, especially in the neck, back, knees, and ankles must suffer keenly from the long periods of standing. As many know, from experience, who have stood in a crowded house during an opera performance (because there were no seats to be had), the fatigue soon becomes excessively painful, yet the dentist stands for a longer time every day in a worse position, bent over his chair. He may fancy that because he does not feel the fatigue at the time, his mind being absorbed in his operation, his system does not suffer as much as it did at the opera, but the strain upon the system is far greater. Indeed, so great that at the close of the day he often succumbs from general exhaustion, in body and brain.

While the dentist is operating, perhaps there are no parts of the body in which he feels such injuries more than in and about the cervical and lumbar regions along the spinal column. Pain is felt not only in and between the vertebræ, strained and pinched by curving of the column for long periods of time, but also in the erector muscles about the column, all of which, after a few years, cause that persistent, painful tiresomeness, so well known to nearly every steady worker at the chair, and which is not experienced by the mechanical dentist.

In a negative way this error of life is made evident to him by comparative freedom from such pain and exhaustion on Sunday, when he rests from his labors and sits most of the time. A still stronger evidence is shown by the improvement in the entire system resulting from a long summer vacation, spent in out-door recreations. I speak of long vacations, because *short* ones are often more destructive than beneficial. For years, during my vacations when after the first few days the strain from routine of business had become relaxed, I was obliged to keep my bed for a considerable part of each day for the first two weeks. When I attempted to take a walk at this time, I could go but a few rods, but after reaching the depths of prostration, and recuperation set in, walking became less and less tedious, until they were a pleasure.

Besides the pains in the neck and other parts of the spine from persistent excessive bending and twisting of the vertebral column there are those from weakened digestive organs, resulting partly from continuous cramping by stooping and partly from gravitation acting upon the weakened tissues sustaining the organs. The liver suffers not only from pressure by this stooping, but from the twist of the body. The bowels by it also become sluggish, leading oftentimes to clogging and impaction in the region of the cæcum.

and the sigmoid flexure, causing by reaction loss of appetite and stupefying of mental energy.

If the dentist runs his burring engine himself, he is liable to add to these weaknesses the so-called "sewing-machine trouble," a result of excessive vibratory action of the psoas muscles. If with these ills he be also affected with the "dentist's leg" (as it is called in England), another result of general tissue weakness, there surely is but little left for the dentist to feel happy over.

The question, "What ought we to do to prevent or to correct the evils?" is easier asked than answered, and easier answered than to carry out the proper way of living to avoid them. One person of limited practice suggests "two hours" spent at dinner; another, "an hour or two of horseback-ride or carriage-ride every day;" another, "a half-holiday once a week." All these are beneficial, if it were possible to carry them out. While the leisure dentist may find time for daylight recreation, it would be difficult, if not impossible, for those who are overrun with professional duties. Still, it needs no argument to prove that daytime recreation out of doors is important. But direct sunlight into the operating-room is of very great value, and goes a long way to prevent this deterioration of body. I have tried all lights, and, having had varied experiences carefully recorded, I could dwell upon the great benefit of direct light, but it would not be strictly relevant to the main object of this paper,—i.e., the saving of energy by sitting.

Probably one of the first wrongs to abolish is self-running of the dental engine. This naturally leads to the highly important essential, a chair assistant, who can help, and thereby save the energies of the operator in many ways. Indeed, I regard an assistant of so great value that for thirty years I have had such help, and for many years I have employed two, and generally three.

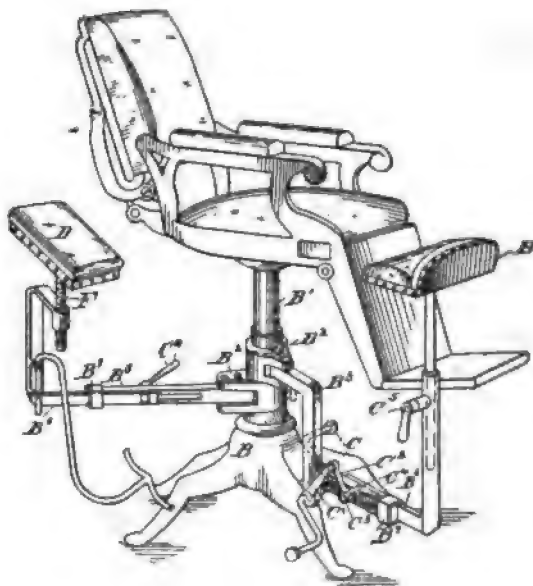
As before mentioned, the operating-chair has much to do with the health. Great effort has been made to perfect these chairs, but notwithstanding progress in this direction, there is a great deal more to be done before perfection will be accomplished, and some of this must be through a return to discarded parts that are old. Most of the head-rests now made are not only too rickety, but are uncomfortable to both patient and operator, and some of them are ridiculously absurd. If the head-rest is of a kind that requires the operator to stoop or twist himself considerably to get at his work, it is dangerous. I feel confident that my own health has suffered irreparably, in years gone by, from working at a chair that was improperly constructed, and I am sure that many den-

tists have found an early grave from the same cause. Stooping causes injury to the lungs as well as weakness of the spine and digestive organs. The chair should be so constructed that it will not be necessary for the dentist to stoop or to twist himself much of the time. Who will give us a perfect chair?

A great saving of vital energy is gained by sitting a part of the time during lengthy operations. Of seats for this purpose there are several kinds; one is independent of the operating-chair, another is connected with it, and there is a third that is connected with the wall of the room. The "Lyon's Seat" and the shoemaker's chair are examples of the first, and the dry-goods counter rickrack seat is an example of the last,—the kind connected with the wall.

I generally stand while operating, but have always had a seat to use if I desired. But until 1884 I used one that was indepen-

FIG. 1.



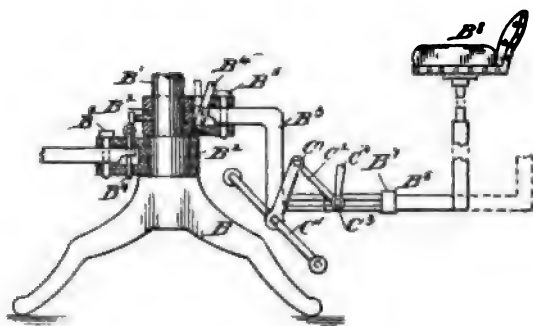
Farrar's Seats for the Operator and Assistant.

dent of the operating-chair, a light, high piano-stool. Since that time I have used one connected with the chair-shaft. (See Fig. 2.) This seat allows me freer action than the independent seat, because it is never in my way, and is easily pushed aside—swung behind the operating-chair—when I have no further use for it. When using it, I generally prefer to stand partly on the right leg, with

the left thrown over the seat in such a way as to support most of my weight on the seat. The right leg in contact with the floor enables me to easily move back and forth between the patient and the instrument-table.

Fig. 1 represents a plan of a seat that I devised, which would supply needs of this kind. In this plan there are two seats,—one, *B*, for the dentist, and the other, *D*, for the assistant. These seats are, however, more elaborate than is necessary, unless every convenience is desired. On my chair I have as yet only the seat indicated by *B*<sup>1</sup>, Fig. 2. This and the other figures show how the different parts are related. Corresponding letters indicate corresponding parts. This figure, an elevation partly in section, repre-

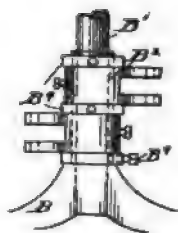
**Fig. 2.**



### The Operator's Seat.

sending the base of an ordinary dental chair and the operator's seat, shows the relation of the anchors  $B^2$ ,  $B^3$  with the shaft  $B^1$ , and the relation of these parts with the crane ( $B^0$ ) supporting the operator's

**Fig. 8.**



**Anchors as applied.**

**FIG. 4.**



### An Anchor.

seat. The several *C*'s represent parts for adjusting by the foot the distance of the seat from the chair.

Fig. 3 represents a side-view of the anchors  $B^2$  and their supporting collars,  $B^4$ , encircling the shaft. These collars are made stationary to the shaft by impinging bolts,  $B^3$ .

Fig. 4 represents a top view of one of the anchors,  $B^2$ , for holding the end of the crane, on the other end of which is the sea. The smaller auxiliaries are for fastening the adjustments of the cranes.

These seats and their various parts are somewhat expensive, but simpler ones, constructed on the same general principles, leaving out the foot-adjustments, are not very expensive. Any blacksmith, having the seat, screw, and nut of a piano-stool, can easily construct one that will serve the purpose.

## ECLECTICISM, THE BEST CONSERVATIVE PRACTICE.

BY DR. CHARLES F. ALLAN, NEWBURGH, N. Y.

THE late World's Columbian Dental Congress, held at Chicago last August, was supposedly a congress, a meeting together, for purposes of professional discussion and education, of the leading dentists of the world; those whose status was the highest and most assured, and those whose dictum as to modes of practice was to be accepted as from the best authority. Such, I say, was supposedly the composition of this widely heralded and much-advertised Congress, and those of you who were present and took part in the discussions know how well this high standard was lived up to.

From one of the chairmen I have heard of a discussion in his Section, that of operative dentistry, in which the position was taken by several dentists of national reputation that amalgam should *never* be used as a filling-material. I have the word of the chairman that this position was not seriously controverted. In the account of the Congress as it appears in the September number of the *Dental Cosmos* this discussion is not mentioned, and I take my statement entirely from the chairman of the Section, who I think is present, and can set me right in case I have overstated. This one-sided discussion was brought up incidentally at a meeting of the Second District Society last October. It occurred to me then that as one of many heresies continually and dogmatically being

<sup>1</sup> Read before the New York Odontological Society, February 20, 1894.

proclaimed, and assuming strength, not from anything inherent in the position taken, but solely from lack of opposition and from the force of bald assertion, it was time the position taken by the profession at large was defended, and I felt I would like to take part in it.

This opportunity I have, incidentally, in the paper you have kindly invited me to prepare for you this evening, and my subject, "Eclecticism, the Best Professional Practice," was suggested by the above incident.

Conservative practice, strictly speaking, should indicate and include eclecticism, that is if the greater is to include the lesser; if the great end of the conservation of the teeth means the use of all measures at our disposal for that end. In a word, conservatism in dentistry should apply to the end to be accomplished rather than to the means, and I hope to prove that eclecticism is the best road to that end—is the truest conservatism.

The wonderful fair just concluded at Chicago, of which, as Americans, we are all so justly proud, was in effect an epitome of all the beauty and comfort, all the appropriateness and usefulness for the great end desired, that are possible in our day; and this result was only attainable because of the judicious use of every scientific and industrial discovery. So, likewise, are the present high possibilities of dentistry only attainable, and the fair should convey to us and to all the rest of the world a great lesson, meaning to us that all means and all materials at our disposal should be used for the saving of teeth.

Generally with professional men, especially with dentists, whose work is so varied and appeals to such different sides of our nature, the tendency is, as we add years to our lives, more and more to work in ruts. No one is so fully rounded in professional ability but that he recognizes that in some one or more phases of his daily work he is deficient; possibly to be made up by more than average ability in another direction. Now, it is human to want to do most that which we can do best, and, with a given lesion before us to treat, we will favor that side, unwittingly, perhaps, when it is in the balance as against another mode of practice.

Talking lately with one of the most prominent physicians of your city, he took the position that specialists in medicine—oculists, aurists, etc.—were to a certain extent losing prestige and the confidence of physicians and patients as well, not because of any lack of ability in their special lines, but by reason of the fact that at times they saw so little beyond their own sphere. The general health and well-being of the patient being for the time lost sight of in the

zealous treatment of the organ or organs diseased. So it is with dentists, particularly those specialists within a specialty.

Every man before me has seen one or more cases of regulating where the result was perfect, judged by the standard of a symmetrical and properly arranged arch of teeth, but if judged by the probable life of the teeth, their present carious condition, and the lack of comfort and consequent lack of confidence in dentists, all due, partially if not wholly, to the regulating procedure, the operation must be considered a dismal failure. As well, you have all seen most beautifully contoured gold fillings, work which you know has taken hours of most conscientious labor, and in which, indeed, is builded part of the life of the operator, and yet from the overtaxing of the strength of the patient there has been begotten a dislike and dread of our profession that has resulted in a neglect and disregard of the teeth that has been fatal to their preservation.

I could multiply examples from the perfect plate-workers and the wonderful bridge-makers, faultless in their technical work, but in some cases, for that very reason, improperly prejudiced in favor of their own solution of a difficulty, in favor of that which they can do best.

All of which goes to show the great necessity of cultivating eclecticism,—the looking at a problem from all sides, and the having that familiarity with all processes and materials that will make our choice of method a properly discriminating and decisive one. Applied to the illustrations I have given you, it would mean in the regulating case that if proper discrimination had been used the young anæmic girl with structurally poor teeth and a very nervous temperament, would not have been put through the months and perhaps years of pain and worry necessary for mechanically moving her teeth into their new and beautifully regular position. The wished-for result has indeed been accomplished, but at too great a sacrifice. Better by far would it have been to have kept that young person well within the limit of her physical endurance, and by perhaps one or two timely extractions and a little use of the corundum have corrected the worst of the deformity, and by so doing have helped to preserve the teeth, and, as well, the confidence of the patient. I think perhaps that nowhere are we called upon for so much broadness of view, for the weighing in the balance of so many opposing conditions, as in the making up of our decisions in these cases.

The same criticism will apply, in a minor degree perhaps, to the examples I gave of the beautifully contoured gold fillings.



No one appreciates more than I do the value of the high ideals set before us by the lamented Drs. Varney and Webb. They sacrificed their lives to the conscientiousness of their work, and we are their beneficiaries; but I do not want to lose sight of Drs. Dunning, Eleazar Parmley, and the few excellent and conscientious soft-foil fillers of a quarter of a century and more ago, and the man who wants to be fully rounded will take lessons from them, and perhaps venerate one class of operators as much as the other.

Nowhere, in the use of materials is eclecticism called for more than in the use of the different preparations of gold, for in our daily work there is occasion for the use of very many of the different kinds furnished us by the dealers.

The dentist moderately young in the profession, who came in under the glamour cast over our fraternity by the use of cohesive gold, particularly when used in conjunction with the electric or the mechanical mallet, and who was taught by his preceptor and college teachers to ignore altogether soft foil (so-called) and worship and use only cohesive foil, has practised under a great disadvantage to both himself and his patients. A proper eclecticism would have indicated to him, as he saw very frequently in the early years of his practice the wonderful results in the saving of teeth obtained by soft foil, that these results could not have been obtained by chance, and were not the result of chance; and that inherently there were good qualities in the material when properly used. This is, I say, the reasonable deduction to be made by any observing and unprejudiced dentist.

I have no desire to belittle the enormous help and advance the introduction of cohesive foil was to us in the making of gold fillings; indeed it can hardly be overestimated. By its use former ideals were made every-day practical results; a new standard of excellence was indeed raised, and the old flat fillings and parallel-sided spaces, so injurious to the teeth, so ruinous to the gingival borders, and uncomfortable to the patient, were relegated to the past, and were not to be resurrected for any length of time even by the eloquence and ingenious arguments of an Arthur.

But all the same, there is a place in our practice for many other kinds of gold than cohesive foil. The various kinds given us by the dealers have widely different qualities, and a proper eclecticism indicates that we should take advantage of these varying qualities to the utmost.

Without particularizing, as regards the mechanical differences and advantages, the plasticity of non-cohesive foil, and in some

degree the very fact that it does not make a homogeneous filling are valuable points in its favor, and often indicate its use ; and the fact must never be forgotten that a superstructure of cohesive gold can be built upon a substratum of non-cohesive foil with as much absolute certainty of permanence of surface as if the filling were built from the foundation built of cohesive gold.

The ideal shape of cavities, with strong walls and margins and but very little undercut, is seldom realized in actual practice, and the ease and perfection with which soft foil adapts itself to irregular surfaces and can be tucked away in undercuts more or less deep combined with the absence of percussion, occasionally so trying to our patients, all go to show that there are great advantages in the use of non-cohesive foils, and that a proper eclecticism compels us to make use of these advantages.

A form of gold perhaps more unreasonably slighted than any other, considering its great merits, is that which we know of as crystal gold. I say unreasonably slighted, because it is in many cases condemned for faults long since eliminated. In the early years of its manufacture the process used was entirely different from that obtaining now ; there was apt to be a certain amount of free acid in the preparation, and fillings made from it were likely to discolor ; it was not then the absolutely pure form of gold it is now. At present no charge of impurity can lie against it.

One of your most prominent members told me but a few weeks ago that he had never used it, and he is a very eclectic practitioner. It is the most cohesive form of gold we have, and is that for which can be manipulated with the least pressure ; so that for use in moderately small cavities, in teeth very sore from wedging, it is invaluable ; and generally, wherever a very cohesive and amenable form of gold is desired before a filling has reached the condition of a smooth level surface, you will find nothing better to your hand than crystal gold.

Most of the gentlemen before me have occasionally, when finishing up a contoured surface of a proximate filling, burnished on one or more pieces of heavy foil, doing so mainly because of the lack of space for plugger-points and rather of necessity, but few of you, I fancy, have considered it a mode of contouring to be generally practised. Some time ago my friend Dr. Van Woert told me he was in the constant habit of using a certain make of No. 30 rolled gold in this manner, and I have since then used it in the same way very frequently. To be able, in contouring a filling in a bicuspid, with the tooth very tender from all kinds of manipulation, and the space

commencing to be contracted as the filling is built out,—to be able then to give up the mallet in any of its forms, and gently burnish on the contouring knuckle with a knowledge that it will stand, is a relief to the patient and a comfort to yourself that only has to be stated to be appreciated.

These are salient examples; but the properly eclectic dentist will probably require and use many other kinds of gold than those mentioned. The gold and platinum or gold and iridium in the heavy numbers, for building up molars, where great wear is expected; crystalloid gold for very heavy work because of the rapidity with which it builds up a filling,—these, with velvet and other cylinders, electric and ribbon gold, for occasional use with the electric or mechanical mallets, are all useful and at times necessary.

The most flagrant case—very seldom seen, I am glad to say—of the absence of eclecticism, where prejudice or ignorance masquerade under the guise of conservatism, is in the non-use of amalgam. That there is a place for amalgam in our practice is proved by the fact that it is used to a more or less extent by at least nineteen-twentieths of the profession, and possibly includes ninety-nine out of a hundred. Indeed, the use of this material is so general that I should hardly be called upon to take it into account at all, under my illustrations of non-eclecticism, were it not that this hundredth man was so rampant, persistent, and assertive. He will not down. It seems to be another but very aggravated case of the obstinate eleven jurors.

I am aware that much is sometimes said in the heat of discussion that the speaker would wish to revise or qualify after time has been given him for reflection, and that many assertions are made dogmatically, but with mental reservations that to the speaker seem inherent to his proposition. The young hearer or reader, however, knows nothing of mental reservations or exceptions, and takes the speaker to mean what he says. He hears the dogmatic assertions from men high in the profession, and these assertions are not, or but mildly, controverted; he knows they are contrary to the teachings and practice of his preceptor and college professors, and he naturally wonders whether he belongs to a profession at all. Now, we have a reason for the faith that is in us, and we should always be ready, yea, anxious to give it, and consistency and the integrity of the profession demand that we should. Our profession should not be discredited while we have a voice to prevent it.

Another case for eclecticism is in the use of something else than our ordinary filling-materials for the repair of decayed or broken

front teeth; something that from an artistic point of view will be repair; something that will resemble the tooth, more particularly where the lesion is in the cutting-edge. Corners can be so neatly and strongly replaced with porcelain, and breaks in the middle of the cutting-edge can be so easily repaired by merely cutting a dovetailed slot and slipping in a previously matched and fitted piece of porcelain, that the free and inartistic display of gold in these places can be and should be avoided.

Turning now from filling-materials to the mechanics necessary for the preparation of cavities and the filling of teeth, we will find probably a greater lack of, and a greater need for, eclecticism than in any other portion of our work. Here, more than in any other department are we apt to work in ruts; we differ so radically in what I may term our mechanical make-up or tendencies, which with many might be called mechanical idiosyncrasies, that there are broad differences between any two of us. In no other department can we learn so continually of our neighbor; in no other branch of our profession is it so necessary for our improvement to be on intimate terms with our dental friends.

Free personal intercourse with other dentists, indeed, is the greatest possible promoter of eclecticism, and in this part of our work is especially desirable.

Most of us can give something to our neighbor, and many of you can give a great deal, and this free intercourse is all in the line of changing a decision from doing that which we can individually do best, to doing that which is actually best for the case in hand. How beautifully ethics and professional gain work in together! The evenings and Sunday afternoons spent with a professional friend should be the most valuable time of the year.

The main importance, I take it, of the various mechanical aids that have been offered us from year to year lies in the direction of simplifying operations; one important phase of which is in making simple and easy cavities out of compound and difficult ones. When we eliminate one difficulty we have so many more resources left to devote to the other difficulties of an operation, and this is the true basis from which to estimate the value of all our mechanical aids.

You have in this great metropolis one or more honored and able laborers who very rarely if ever use the rubber dam; they are men of the highest professional standing, whose ideals are the same as yours; you look up to them for advice and respect them for their results, and yet if the standard I have advocated in this paper is correct they have not fully lived up to the best that is in them.

A dentist who does not use the rubber dam may in some cases equal the best work of him who does, but that will not give the former man a clean bill. The question is not, have I filled the cavity as well as my neighbor? but, have I done it as well and with as much comfort to my patient as if I had used the rubber dam?

*A man's standard should not be that of somebody else, but it should be the best that is in him when he has taken advantage of every aid at his disposal.*

In the use of many therapeutic remedies, as well as in the performance of mechanical operations, the rubber dam is almost a *sine qua non*, and the man who disclaims its help must of necessity be a great loser.

In my own city there are one or two dentists who take pride in the fact that they never use the dental engine,—have none in their offices,—and you will find, I fancy, similar cases in every large city in the land. Most of such people decline the great assistance of proper instruments and machinery to pander improperly and unreasonably to the physical weaknesses of their patients, and it is their patients who in the end suffer most sadly. They use a double-edged sword, and while the temporary makeshifts to which they resort cause the loss of the teeth, their strictures, real or implied, on the bulk of the profession who do use machines and machinery, encourage distrust; this is dishonesty, and does not come within the limits of this paper for discussion.

A charlatan is of necessity a narrow-minded man, and a narrow-minded man, in the very nature of things, cannot be eclectic, for eclecticism goes with and encourages breadth of character and sincerity of purpose, the best elements of professional life.

There are, however, men in our profession of an entirely different class, honest to a degree, who have never been able to see the excess of merit of machines over hand instruments. They are mostly among the elder members of the profession, who, having attained the greatest possible facility in the digital manipulation of hand instruments before dental engines were invented, unwittingly magnify their own dexterity, as opposed to the benefits to be gained by the sometimes use of the dental engine; and to expect them to change their life-long practice is, possibly, hoping for eclecticism under very difficult conditions.

It hardly seems necessary, however, to argue for the use of necessary machinery. The dental engine makes possible some work which is impossible with hand instruments alone, and it makes easy and rapid and endurable much work that would be very difficult

and tedious without it. Our capacity for dental work is infinitely extended by its use, and the man who does not take advantage of it can but be a loser. What he can do for his patients under certain circumstances, what *he only* can do best, cannot be what is best for his patients.

The same argument applies to the use of the many devices, such as rubber-dam clamps, separators, etc. The earnest eclectic operator must have them in all their forms; to illustrate, you have a very large cavity, nearly exposing the pulp and encroaching on the gingival borders, on the distal face of a second superior molar, in a mouth very moist and with the muscles rigid; a combination of circumstances you all know very difficult to manage. Now, how much it will simplify your operation if you have a rubber-dam clamp so neatly and properly fashioned that it will grasp the third molar without impinging on the festoons of the gum, and so practically without pain; that will stay put exactly as you place it, without any movement, and which has flanges large enough to hold a napkin in place if necessary, and will of course keep the rubber dam in position if used. More than half the battle is at once won. Such clamps are to be had, but I do not think they are generally used, though I know the want of a properly constructed clamp for superior third and second molars has been seriously felt for many years.

Now, if my arguments have been founded on correct theories and a proper standard of ethics, and if my illustrations have been of any pertinency to enforce my arguments, surely the absolute necessity of eclecticism to bring out what is best in us professionally is evident. I almost think I hear some of you whisper, "This goes without saying,"—in theory perhaps, but how is it in practice?

When men prominent in the profession, before the World's Columbian Dental Congress, say that amalgam should *never* be used when others in various places say that cohesive gold-foil is the only form of gold proper to be used, which statement is further supplemented by one from others still more radical, who affirm that it should only be used in connection with the electric mallet; when some dentists say they never use the rubber dam, and your neighbor asserts he never uses the dental engine, you will pardon me if I say before this, the most eclectic and progressive dental society in the world, that I believe a plea, and an urgent one, for eclecticism is in order.

CROWN- AND BRIDGE-WORK.<sup>1</sup>

BY CECIL P. WILSON, D.M.D.

I do not know that I have anything especially new to offer on this subject. It seems to me, however, that sufficient time has elapsed since the introduction of artificial crown- and bridge-work to enable the profession to come to some conclusions regarding its merits and defects.

The first piece of bridge-work I ever saw was in a dental office where this branch of the profession was carried on on an extensive scale. It was in the mouth of a paid attendant,—a sort of walking show-case,—who kept his mouth as clean as possible, and held himself in readiness to exhibit it to those who desired ocular demonstration of the new methods of inserting artificial dentures. This piece of bridge-work was in the upper jaw, and consisted of fourteen teeth, having for anchorages the cuspid and molar teeth. This piece, as I remember it, did not appear to be a success from an æsthetic point of view. The absence of artificial gum failed to give a proper contour to the mouth, and the teeth were set so closely together, and with such extreme regularity, it had an artificial look. In a mechanical sense, however, it was well put together and made a handsome showing, was novel and interesting to look at, and seemed to suggest great possibilities for the future.

The criticisms of permanent bridge-work show a wide diversity of opinion. One man says, "But as a practical fact, permanent bridges are simply the nastiest things ever made to do duty as substitutes for nature's work;" while another says, "The truth is, a skilfully constructed and properly adapted bridge is one of the most elegant and cleanly operations in dentistry, and is the most perfect substitute at present known for supplying the loss of the natural teeth. In the *Dental Cosmos* of January, 1884, Dr. J. L. Williams of Boston, one of the past presidents of this society, gave his opinion as follows :

"To the Editor of the *Dental Cosmos* :

"DEAR SIR,—To correct any misapprehension, I wish to say in regard to the so-called bridge-work, now somewhat discussed, that from observations of a variety of fixtures of that sort since 1844 to the present time (some of them very skilfully made), I do not recom-

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<sup>1</sup> Read before the Academy of Dental Science, January 3, 1894.

ment as cleanly and wholesome in the mouth any extensive appliance that can not be removed daily for cleaning, and I consider as unpardonable the practice of cutting of good and useful teeth merely to use their roots for supports of a 'bridge.'"

I presume our Boston Dr. Williams did not wish to be responsible for the sayings of the New Haven Dr. Williams, both having the same initials, and he took occasion to define his position in the matter. At all events, the opinion of a man who has been a close observer in our profession for forty years and more is worth something.

Dr. Williams's reference to the cutting of good and useful teeth reminds me of a dentist who lost a central incisor in early life and wore a porcelain substitute, mounted on a suction plate, for a great many years. When bridge-work was introduced the plate was discarded, the good central cut off, and the pulp destroyed. Subsequently, a Richmond crown (with dummy central attached) was constructed, which, I believe, has been worn for about ten or twelve years, and with which he expresses himself as completely satisfied.

This gentleman is an intelligent observer in good standing in our profession, and I often wonder if he is willing to take the responsibility of practising such methods on his patients. There are cases where such heroic treatment might not be considered objectionable, but, as a rule, the cutting off of sound teeth to make way for bridge-work is reprehensible practice and should be strongly condemned. I do not make extensive pieces of bridge-work, for reasons which I shall give later, though my experience leads me to believe that small pieces can be used to good advantage. For a time I was quite enthusiastic over permanent bridge-work, but I discovered certain objections, three of which are, difficulty of cleaning, risk of stopping up pulpless teeth, which are liable to give trouble, and liability of porcelain crowns to fracture. I know there are enthusiastic advocates of permanent bridge-work, who think such fixtures are as easily cleaned as the natural teeth, but my observations have led me to form a different opinion. A few weeks ago I took a large piece of calculus from the mouth of a fastidious person, who nearly fainted at the idea of having such a thing in her mouth, and I am persuaded that there are many such people now wearing pieces of bridge-work, unsuitable from a hygienic point of view, either because of unfavorable conditions or faulty construction.

If such individuals could examine their mouths with the critical eye of a dentist, I think they would discard such fixtures and ask



for a substitution of some other kind. Notwithstanding our advanced knowledge of the care of pulpless teeth, and the numberless therapeutic agents at our command, it must be admitted that there are pulpless teeth which cannot be permanently filled, and a good many cases where a consideration of diathesis and constitution would seem to warrant a conservative course.

All such cases are unsuited to permanent bridge-work. There are veterans of the old school who still carve their own teeth, and who look with disdain, and not without reason, upon the teeth furnished us by the manufacturers of the present day. Sillex is the mainstay and backbone of tooth-body. Moulded teeth are generally lacking in this essential ingredient, hence they are weaker than they ought to be and liable to fracture. Occasionally I come across an unusually weak piece of porcelain. Some years ago I made an upper set of plain teeth on rubber for a gentleman, who came back in a few days with one of the teeth broken. He assured me the teeth had not been subjected to any undue strain, and that the tooth had broken off while eating his dinner, which consisted of soft food. Inside of two weeks two other teeth broke off in the same way. I then took off all the teeth and replaced them with a new set, which was worn, without any further accident, until his death some seven or eight years after. If this had been a case of permanent bridge-work, it would have been exceedingly trying to both patient and dentist. To my mind, the liability of porcelain teeth to fracture is a serious objection to the use of permanent bridge-work. For single crowns I use the Richmond method, the arguments in favor of this system of crowning teeth, to my mind, far outweighing any that can be brought against it. By the use of this crown a larger proportion of tooth-substance can be saved than by any other. With all porcelain crowns, on the contrary, it is necessary to cut away the tooth to the level of the gum. In making Richmond crowns, I use eighteen-karat gold, from thirty-two to thirty-four gauge. I do not care for the stretching or elastic properties found in the softer kinds of gold, and while it is a little more difficult to adapt the stiffer gold to the root, it has more stability, and, being thinner, offers less chance for accumulations around it. The arguments against it are the showing of the gold band and difficulty of construction. I am occasionally asked by a patient if the band will show, but seldom have any complaints when the crown is completed. The length of time consumed in the construction of a Richmond crown depends entirely upon the operator. A man who bends a band or ferrule to a root for the first time is apt to find his calcula-

tions wide of the mark ; but, with constant practice, his eye become so trained that the size of the root can be taken in almost at once and the first fitting is apt to be pretty nearly correct. Those who try to make Richmond crowns from models must inevitably fail. In the mouth we have the yielding gum, and the natural root which offers resistance to the gold without any danger of chipping away whereas, in casts of plaster and fusible metal, these conditions are entirely wanting ; therefore, the bands or ferrules should in all cases be fitted to the natural root and the two ends joined together with solder before the patient leaves the chair. In order to convey to your minds as clearly as possible what I have to say, I have made a few drawings of pieces of bridge-work. It will be observed, in the first place, that the central incisor is missing, and between the other roots and teeth there are wide spaces. The bridge consisted of three teeth extending from the left central to the right lateral. I was somewhat at a loss to know how to join these teeth together. The ordinary method of constructing bridge-work at the time this was made consisted of placing the teeth side by side and joining them by their "backings." This method of procedure was impossible in this case, owing to the wide spaces between the teeth.

The difficulty was overcome, however, by fitting a stout piece of platinum and iridium wire to the palatal surfaces of the teeth and bearing on the gum. The wire was closely adapted to the gum, and, from the front of the mouth, clear spaces could be seen and the form of attachment was entirely out of sight. Care was taken to trim the circumference of each root, in order that the bands might fit as accurately as possible. A Richmond crown was made for the left lateral incisor, which was to be placed in position independent of the bridge. Crowns were then made for the left central and right lateral, placed in position with a dummy tooth in between, then removed and finished in the usual manner. The bands were perfectly adapted to the roots, and fitted with such accuracy that some force was necessary to remove the crowns.

On attempting to try in the completed bridge, I found it would not go in place without a good deal of coaxing and pushing, and when finally placed in position the bands were slightly bent from their original shape. This opened my eyes to an unavoidable imperfection in permanent bridge-work. The person never was born whose teeth are on exactly parallel lines with each other ; consequently no piece of bridge-work can be constructed which can accurately, in the true sense of the word, fit the roots upon which

it is placed. If a single crown is made with a poorly-fitting band, the result is more or less inflammation about the gum, exposure of the band, and possible irritation of the peridental membrane.

Now, this condition of things must inevitably be present to a greater or less extent in permanent bridge-work. As I have said before, the bands fitted accurately; if, however, after forcing the completed bridge into place, I had cut the platinum wire which held the crowns together, and separated them, I should probably have found them somewhat loose, with an adaptation of the bands to the roots, less perfect than in the case of the lateral incisor, which was made independent of the bridge. This bridge was worn about two years, when it became loose. Before replacing it, holes were bored through the gold in the base of each crown to allow for overflow of cement, the holes afterwards being stopped up with gutta-percha. This was worn about two years, when the cement gave out a second time. The third time red gutta-percha, such as is used for base-plates, was substituted for oxyphosphate of zinc, which had been previously used, and for a time everything went on well. It will be observed, in this case, there is considerable overbite, and the lower teeth acting as levers forced the bridge out of place, necessitating a removal of the bridge a third time. I then cut the wire which connected the right lateral with the dummy central, smoothed down the projecting points, and replaced the teeth with cement.

I saw the case some three months since, and at that time it seemed to be doing well. The left lateral incisor crown remains in just the same condition as when first placed in position. This crown was a success, for the reason that, being unhampered by any other tooth, it was possible to push it directly into place. There was no straining or bending of the band which could cause any deviation from its original form, thus assuring a continuity of surface and an hermetically sealed root, which prevented the secretions from coming in contact with the cement.

Another, I constructed, consisted of a piece extending from the right central to the right molar; as can be seen by the sketch, the right central and second bicuspid are missing. Crowns were made for the cuspid and first bicuspid roots, also dummy crowns to take the place of the missing central and second bicuspid. To this latter was also soldered a platinum pin which projected into a cavity in the first molar tooth. This cavity was afterwards filled around the pin and assisted in maintaining the stability of the piece. The central was connected with the cuspid by a gold bar, curving around

the lateral incisor and bearing on the gum. When finished, this made a complete bridge from the right central to the first molar tooth. It was impossible to thoroughly clean the bar around the lateral, and, as a consequence, disintegration of the tooth went slowly on until it finally broke off. Instead of taking off the entire bridge for the purpose of adding a new lateral, I cut the bridge in between the cuspid and bicuspid, made a new cuspid and lateral, to which was added the dummy central, making another bridge independent of the other.

When the cuspid crown was removed I found the root and cement in perfect condition, notwithstanding the fact that this bridge had been worn a year longer than the previous bridge to which I have alluded. Another piece of bridge-work, which has been worn about ten years, is very similar to the last, with the exception of the gold bar, which curved around the canine instead of the lateral, as previously mentioned. I saw this case about two years ago, and there were indications of disintegration around the cuspid tooth; otherwise the piece was apparently in good condition.

This last sketch is supposed to represent a case for which I made a piece of removable bridge-work. There are the four incisors, a first left bicuspid, second bicuspid root, and one molar tooth. With the exception of the bicuspid root, all the teeth are alive. Several of the molar teeth in this case were lost in early life, and, as a result, the upper jaw is somewhat contracted and there is a slight protrusion of the lower jaw. A few years ago the protruding lower teeth began to gradually wear away the labial aspect of the incisors, until they assumed an unsightly appearance, and an artificial piece of some kind was rendered imperative. Perhaps it may increase the interest in this case a little to say that I am speaking of my own mouth. The labial surfaces of the incisor teeth were worn away as represented in the sketch. It seemed wicked to destroy the pulps of these perfectly sound teeth, and, being averse to extraction, I decided to make a piece of bridge-work. A gold cap was made for the bicuspid tooth, and the inclined plane of the incisor teeth smoothed down as much as possible. Richmond crowns were then made of carved teeth for the lateral incisors, an all porcelain tooth to take the place of the missing cuspid, and two pieces of porcelain which were made to fit accurately the central incisors. The five teeth and bicuspid cap were then joined together in the usual way and finished. The palatal surfaces of the carved incisor teeth were only half as thick as on the labial surfaces, and this necessarily left the porcelain weak in just the place where the most

strength was needed. After the piece had been worn as a removable bridge for about six months, I decided to grind away more of the natural incisors to admit of larger and stronger porcelain teeth and to make more sure of a larger and more extensive piece of bridge-work. Gold caps were then made for the molar and bicuspid teeth, porcelain teeth were made to fill all the vacant spaces, and the result was a bridge extending entirely around the mouth and articulating perfectly with the twelve teeth in the lower jaw. In thinking over what I wanted to say this evening, I realized that it was easy to drift into considerable detail which would be tedious and uninteresting to my hearers; therefore, I have not touched upon several points, properly belonging to this subject, which will probably be brought out during the discussion which follows.

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## PORCELAIN CONTOURS.<sup>1</sup>

BY GEORGE F. GRANT, D.M.D., BOSTON.

THE ideas to which I wish to call your attention this evening have been taking form in my mind for some years past.

It has been my thought for some time that we should be able to more nearly approach natural appearance in the restoration of those portions of the anterior teeth which have been lost through decay or fracture. We have, perhaps, been too conservative in this matter in aiming at permanence to the sacrifice of æsthetic considerations.

Doubtless you will argue to this proposition that no contour gold filling, however skilfully made, has anything but its technical perfection to recommend it, and is therefore a failure because it simply replaces one defect in appearance with another.

The great need of our profession to-day is, I think, a new filling-material. The properties it should possess are too well understood to need consideration here. That we shall have it before many years is a safe prophecy.

While many methods of restoring the labial surfaces of the anterior teeth with porcelain inlays have been and are employed, we cannot say that our success has been satisfactory to our best feeling. The subject of inlays may be left, however, for future consideration.

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<sup>1</sup> Read before the Harvard Odontological Society, December 28, 1893.

Many cases have occurred in my practice where gold could not be used to restore the lost portions of front teeth. Sometimes the necessary retaining cavities could not be made; in other cases patients have objected to the use of gold on account of the unsightly appearance of such large contours made of it.

My purpose in offering this paper is to bring about a comparison of views as to the best method of procedure in such cases. My efforts in this line have been attended with a widely-varied success.

For an example we will take a central incisor which has been broken; say one-third is missing either diagonally from approximal surface to cutting-edge, or that it is broken in a line parallel with the cutting-edge. It is very desirable to restore such a tooth with the least possible disfigurement, also, if possible, without devitalizing the pulp. The first step is to make the base or fractured surface as nearly a plane as is possible. This insures the maximum of strength in the porcelain tip which is to be used in contouring. Wherever possible, it is desirable to obtain sufficient width labio-lingually to allow of the insertion of at least two pins or dowels, which I place at points quite near the approximal surfaces in a transverse fracture, being governed in other cases by existing conditions. For instance, in case of a fracture which took a diagonal direction, such as to leave a weak corner on the tip, I should not hesitate to sacrifice a little of the natural tooth by cutting back vertically, so as to reduce the obliqueness. By this course much strength of body in the tip is gained, as well as the advantage of being able to insert both dowels in a line with the axis of the tooth. This cutting of the tooth is much less painful if performed with fine corundum wheels.

I have lately been experimenting with wheels made of a metal charged with diamond-dust. The advantage they seem to possess over any other instrument is that they are much more rapid in operation, give less vibration, and cut a perfectly accurate angle or curve which cannot be obtained with any other wheel. I wish to say, incidentally, here, that no form of chisel or coarse wheel can be expected to make a perfect or even a good surface on a hard surface like enamel.

Until I began using corundum wheels for shaping the edges of cavities to receive gold fillings there was a feeling of insecurity in my mind as to what kind of a result might be expected.

In using instruments charged with diamond-dust I prefer water to any other medium on the natural teeth, using oil only in drilling porcelain.

Having prepared the surface carefully, the next step is drilling pits for the dowels. The drill used should be slightly longer than the wire of which the dowels are made. If a twist drill—which is the best form—is used, it should be protected by a guard set at the desired depth to prevent going too deeply. I use carbolic acid, full strength, on a drill for the natural tooth in the same manner as on the diamond drill in porcelain. It seems to allay the pain quite considerably.

After drilling, the dowels are placed in position and an impression taken in which the dowels are withdrawn. To the cast made from this impression the porcelain tip or contour is accurately fitted. It may be carved and fired or it may be made by cutting a piece from a porcelain tooth of the exact shade desired. It is so much easier to cut from a tooth than to carve the contour, that I always adopt that plan. Porcelain is easily cut with rubber and corundum disks if plenty of water is used with them. True, they can be cut more accurately with the diamond disk, but until lately diamond tools were too uncertain and expensive. The firm of Godber & Parker, of Waltham, have of late been making some very fine work for me in this line at a very moderate cost. I have been able to get from them just such instruments as I have always wished for but never before obtained.

We have now the cast, with the pins in position, also one bit of porcelain, which is to be fitted to it. First withdraw the pins from the cast, then fit by grinding until contact is as perfect as can be obtained. The points at which the holes are to be drilled in the porcelain are then marked, and when drilled the parts should come together with the platina dowels in position.

There are two ways of procedure from this point. The first is to simply set the dowels in the tooth with zinc phosphates, and afterwards set the tip upon them with the same material.

This is not so good, however, as to fuse the pins into the porcelain with some powdered glass or other material like the Downie crown flux, which melts at quite a low temperature. The strength of the porcelain tip is thus greatly increased, and there is another quite important point gained,—that the tip so treated is more transparent than one in which the pins are set with phosphate. While the labial surfaces of the tip should not present any prominence, it is quite possible that the lingual surface might overhang slightly; in fact, it would be better to leave it so until the point was firmly fixed in the tooth and finish it down the last thing with fine corundum, either wheels or wood points charged with corundum powder.

Another form of contour is where a considerable portion of the tooth has been lost through caries of the approximal surface. These cases present some features which require a little different treatment. They are prepared almost in the same manner as for a gold contour, except that, if possible, the edges are made perfectly flat. Usually there is no opportunity for the drilling of dowel-holes. This difficulty is met in the following manner: After the porcelain contour is accurately fitted, a deep slot is cut nearly the whole length of basal surface. Into this slot is inserted a strip of platina double or folded together so that the edges projecting from the slot open like the leaves of a book. When this platina is fused into the porcelain the edges can be turned back at any angle, this giving a firm support and means of secure attachment to the tooth.

I have also found a slight modification of this idea quite serviceable in labial inlays where the cavity was of considerable depth.

In any case where the drilling of a porcelain piece may be attended with danger, a slot can be safely cut and a flattened pin or other bit of platina as securely fastened by baking as though inserted in a drilled cavity.

Operations of this kind are very satisfactory to the eye, and possess considerable strength. It is not claimed that they are as strong as gold contours can be made, but it is an open question whether they do not on the whole compare favorably when all things are considered. They relieve both patient and operator of the most disagreeable features incident to protracted sittings, as the greater part of the work is done out of the mouth.

As to the instruments which I have shown, I will say that some of them are first attempts of the makers, and will be greatly improved in the future. The diamond saws are made after the style of the Merriam saw. Even in their present imperfect state they are an immense improvement over any other instrument which I have seen. They run smoothly, having none of that extremely unpleasant rasp inseparable from a toothed wheel. When kept wet with water or carbolic acid and alcohol they produce very little pain, even in amputation of a live tooth. In fact, a little close observation seems to establish the feeling that a large part of the pain incident to dental operations is so clearly the result of nervous irritation, induced by the noise and vibration of coarse-cutting engine-tools, that an improvement in this direction is very much to be desired.



AMERICAN DENTISTRY IN LONDON.<sup>1</sup>

BY FRANK M. WILKINSON, D.M.D., BOSTON.

THE object of this short paper is to throw light upon a subject of which comparatively little is known in America, and doubtless much chagrin has been experienced by the profession at large on account of the action of the General Medical Council in London in regard to the two dental schools recently disqualified for registration in Great Britain.

Yet when the facts have been clearly set before the profession, it will not be so surprising that such action was taken, but rather that it was so long delayed. American dentistry in England is advertised most extensively and traded upon by most who practise, or pretend to practise, it simply because of the general admission in England of the superiority of it as compared with that practised by other nationalities. The easy credulity of the English public in this matter leads them to be duped by that which is called American, although those who practise under this title are not of that nationality or schooling. The consequence is, that the grossest maltreatment, to speak plainly, is perpetrated, both in supposed-to-be swell private practices as well as in the advertising "limited" companies, who carry on a trade in dentistry rather than a respectable practice. It is well known by the English dentists that this is a great wrong, not only to them, but to the people who are the victims of this avariciousness; they unscrupulously charge the exorbitant fee because it is "American dentistry," while the truth of the matter is, dentists of ability in the States are not guilty of performing operations such as are classed here as American. As a result, the standard of American dentistry in London is anything but what we could wish, and, as seen by most English dentists, is far from being a credit to those who should be representatives of the profession, capable of upholding its high reputation and standard abroad. Why is this? naturally may be asked. The answer is not very hard to find, when it is known that there are several companies in London, with branches throughout England, who claim to be, and advertise as, Americans, and it is certain that many whom they employ are young men from the States. Every dentist who carries on a respectable practice will most emphatically condemn their

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<sup>1</sup> Read before Harvard Odontological Society, January 25, 1894.

methods. Some of the work done is not worthy of any American, yet fee enough is charged to command the best obtainable service from the hands of our experts. Their charges are excessive and what is really bad.

With this state of affairs going on for years, it is not surprising that our standard should be looked upon as no improvement upon that of the English. In private practices, there are many at present who for years worked for these firms, and finally established themselves when their time expired for which they were "bought out," for no one can secure a position who will not sign a contract that binds out of London for so many miles and for so many years. Some of these men go on with the same kind of work, and cost more money. Even in the aristocratic West End (which one might think would be free from such) they are to be found. Some who never attended college put "Dr." on their door-plate, and "Doctor of Dental Surgery" appears, in so many words, on advertising cards, in defiance of the law restricting them from practising in Great Britain. There are men who charge five hundred dollars (and it has been paid) for a full denture, gold base and rubber attachment, while if a tooth be a trifle off color, it is cut off and a crown put on at large expense. Many of these charlatans place large fillings over putrescent pulps, while the best is being paid for and supposed to be received. There are many working in this way against whom the more learned and skilful have to compete, the latter in modest and professional manner, while the former class are obtrusive and gain the patronage of the wealthy and the nobility for the reason that, being Americans, better services are supposed to necessarily follow. What wonder that the standard is not being elevated! But some there are who are faithful and conscientious and the English dentist is fair enough to acknowledge a good production from the land of the Stars and Stripes.

Graduates of American schools have practically no opportunity of securing good situations in England at the present time. A law has recently been passed by the General Medical Council forbidding dentists, under penalty of having their names removed from the register, to employ unregistered assistants. The only opening for the graduate is to take the examination for the degree of "D. S." (Ireland), "sine curriculo," in Dublin. Three Harvard men have passed successfully, and are now registered. Let those who go to practise in London adhere to the principles they have been taught before leaving this country, and there will be a change for the better.

Let all diplomas be disqualified (as the British diplomas are) when graduates are involved with firms of the aforesaid description, and the day will not be far distant when a different state of affairs will be presented, and firms which bring discredit upon the fair name of American dentistry will have little excuse for their existence.

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### AMALGAM *VERSUS* GOLD.

BY DR. GEORGE A. MILLS, NEW YORK.

WE judge that, after forty-two years of more than ordinary interest in dental practice, we are prepared to express our thoughts upon this subject. These who know us will give credit for following what we believe to be our convictions. No one has more earnestly or more faithfully advocated the importance of our calling, and it is because of the increased value of its importance that we propose to put ourselves on record regarding a duty towards those that as sincerely seek at our hands the services they need, as we all sincerely desire to give these services. If dental practice means more one thing than another, the emphasis should be put upon the thought of saving teeth in as large a percentage as possible, and this with the smallest expenditure of time, money, and nervous force. We are prepared to say that the last thirty years has a large account against us, and we think that the next thirty should be as devotedly used for the cancelling of this account. It is only necessary to hint at the experience of all earnest operators who have followed close upon us during this term of years. To say it has been a burden of great expense to us all, both patient and operator, is only saying what all know to be true.

Truly it can be characterized as the Golden Age. It has been said by some to have been the "Gold craze." No, not a craze in any sense, but as sincere a desire as ever possessed any class of men to perform their whole duty. The use of gold for filling teeth has been carried to its fullest extreme. Atkinson, Varney, Webb, and Brown will stand among the notables in this line of service. They have shown us the perfection with which this metal can be handled, even to the ideal, both in its thoroughness of compact and its correspondence to Nature's forms and contact, giving back to the possessor of the sadly deformed masticating apparatus as

comfortable and useful a reconstruction as it is possible for a to devise with this material upon Nature's foundations.

Have they done all this amiss? Certainly not. They have acted up to their best light considering the human entanglements that have involved their career. We allude to this that it may be said, with any effective force, "I told you so." We are not in sympathy at all with the weak and unwise criticism, even if it be called criticism, that has come from not a few worthy persons regarding the handiwork of these extreme and skilful operators. Every one of them has emphasized excellence, which has a decided bearing upon all the service that we are called upon to render. Everything that is worth doing commands our best attention, let it be understood that we have in mind only those who have a conscientious desire for the good of those who place themselves under their care. Let us ask a question that will appeal to all upright practitioners. Have you not frequently been brought to face—in view of a lamentable failure—with this thought: Would I not, in view of what I now see, and in case I could retract my steps, change my dealings with a hope of far different results, and give to my patient a service much larger in proportion? How many of us are always manly enough to meet such a demand squarely and fairly, and say, I have learned a lesson that shall serve for all time? These experiences do, more or less, influence our course, but none of us who are really skilful come down easily. Humility is not a crowning virtue. It is only when a bold strategy comes like that applied by our genial Foster Flagg that we become reflective, and not then while under the first effect of the lash.

Since that time we have had opportunity to reflect; and we have reflected, and to all men of judgment this has brought about a decidedly eclectic procedure, and a larger range of conservative practice; while, on the other hand, it has afforded an occasion for others to cater unwisely to the weaknesses of a clientele of the so-called *élite*, which has not proved economical in time, money, or saving of teeth. These things are so well understood by observing men that we need only refer to the fact. It is not necessary to capitulate what is well known by all readers of our journals,—that the "causes of failure in filling teeth" has become a hackneyed topic, without really touching the principles that lead to the prolific failures that are occurring on all hands to a greater or less degree. True, we are under human limitations, but to say that we have reached the largest possibilities in saving teeth, even with the knowledge in our hands, is not squaring ourselves to the facts.

At this stage of our article we are prepared to say intelligently, and without any fear of the contrary being proved, that we have in our hands both knowledge and an ally that will enable us to so change our practice that we can increase the salvatory service—which is so much needed—in a very large percentage above what we have previously been able to do. We do not advocate the practice that we are aiming at in this article because of the inability of the many to save teeth during long terms of years, but it is because we are facing well-considered convictions that we can do all this and much more with far less expense to all parties concerned.

One of the most painstaking operators in Brooklyn, and none more skilful, said lately, showing some very elaborate fillings in the molars and bicuspidæ made under great difficulties, but successful now for a period of twenty-three years, "To-day I would not repeat such an effort. I can do as well with a great reduction of cost." Said he, "I put my very life into that work, and no man can ever hope to be paid a fair compensation for such service."

No one, for a moment, would hesitate to laud the discovery of a gold plastic for filling, but what will many say when the fact is stated that we have a plastic metal filling that will meet the larger demands with a greater percentage of success directly at hand? Does some one say now, with bated breath, that we are to be faced with the advocacy of the so-called "*Amalgam versus Gold*"? Yes, for we have never made an effort with firmer purpose than this or more faith that it will result in fruitage. We know intuitively that many are occupying their thought in the same direction. This reform of our practice is a foregone conclusion, and the way to bring it about is to openly advocate it.

Let it be understood that we frankly and understandingly declare it to be our discriminating belief that amalgam, as it is offered to us to-day, has in it the largest possibilities of any of the other materials. We hardly need to call attention to the former objections so far as discoloring, for this material is now free from that defect. The shrinking and bulging is not worthy of intelligent attention, and so far as the objection made to its deleterious effect upon the system, it stands "not proven."

Now that we have unmasked our purpose, we will endeavor to lead the attention to the fact that must enlist the emphasis upon two essential additional points of practice, in order that our statements may be proved to the fullest extent. Nothing but real ability will bring the largest amount of success. The first of these essential points is the securing of the best possible sanitary conditions.



Antiseptic lotions and tooth-brushes, and here and there atomizing of a numberless variety of medicaments, will not meet the demands of a majority of cases. Nothing but a radical intelligent dealing will be efficacious. Having secured this, we have reduced the exciting cause of caries to a minimum.

Now we are prepared for the next essential step,—i.e., the preparation of the tooth for receiving the filling-material. I only advocate what others have done, bestow the same care and thoroughness in the one case as in the other. When practitioners have more largely devoted their faithful attention to these all-essential points, we will then have far less cause to discuss why our fillings fail. Carry out these teachings, and they will do more to aid the overworked practitioner and bring from our patients such plaudits of praise as we have never conceived. If you believe from your heart, through your head, that the declaration of this is true, there will be but little difficulty in carrying it into practice. If the truth of this article is recognized, many must inevitably adopt it.

We will close by prophesying that gold will have to give way to amalgam and acknowledge its superiority. Nothing stands in the way of its rightful position but prejudiced thought formed by ignorance and past associations. We have done much in the filling of teeth in past days along all the most advanced lines.

Our practice has so changed during the last fifteen years that we have been largely spared the laborious work of dealing with extensive and difficult operations in filling. Our surgical work has largely taken the place of this line of service. We are content to believe that we are much relieved from the arduous labor of this branch of practice. We have done many things under the conviction that we were advocating for the good of our fellows, and none more so than this. That we may have the best material possible, we hail it a favorable omen that Dr. Morgan Howe has called the attention of the Odonotological Society of New York to the great need of taking steps for securing the best formulæ for amalgam, and this by the employment of expert scientific ability, outside the profession if required. The day will come when we will acknowledge our indebtedness to Dr. Clowes, of New York, for his abiding faith in the ultimate recognition of the value of amalgam. He has stood steadfast even to date, and there has been no more honest or able advocate, and all his practice has had the stamp of integrity upon it. It is very largely because amalgam has been made a substitute that it has had very indifferent consideration so far as associating skill with its use.

We are not declaring that gold is not to have any place as a filling-material, but we do declare that it cannot be made to serve the purpose of saving the greater number of teeth that most need saving. We have emphasized the importance of securing for the teeth the best possible sanitary conditions, and the most skilful preparation for filling, and we add to this the same painstaking in finishing as we give to our most elaborate gold fillings. Then impress our patients with the responsibility that rests upon them for their proper care. We have for many years advocated that indifference to sanitary conditions stood against the mass of practitioners as the flagrant cause of failure of fillings, and we can truthfully say that to this must be added indifferent attention to the care of the teeth attacked by caries. To be sure, we cannot guarantee against more or less deformation occurring, though we do our best. There is a larger helpfulness of an advance in a salvatory service if these views here given shall be put into practical use, and we are also sure that our patients will be ready to accept the purpose of our earnest and intelligent service.

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## A SUBSTITUTE FOR COPPER AMALGAM.

BY WILLIAM H. TRUUMAN, D.D.S., PHILADELPHIA.

FOR filling children's teeth, for filling fissures in soft or imperfectly calcified teeth, such as Dr. Perry refers to, page 155, current volume of this journal, and in all cases where from any cause it is desired to use a very plastic amalgam, I have been using for a year or more, with much satisfaction, a heavily silvered alloy, sixty parts of silver to forty parts of tin, using with it sufficient mercury to produce the desired plasticity. If made as recommended by Dr. Flagg, in his excellent work upon "Plastic Fillings," and the alloy cut up with a fine file, or, as I prefer, reduced to delicate mat-surfaced shavings in a turning lathe, a thorough trituration produces a soft plastic mix that with but little pressure is readily and quickly adapted to the cavity by patting with a lock of cotton. It sets very promptly, and makes for these cases a fairly satisfactory filling. It must be borne in mind, however, that an extra amount of mercury favors shrinkage and impairs edge strength, but with heavily silvered alloys to a far less degree than with alloys containing a larger percentage of tin. It takes the place of, and is much to be preferred to copper amalgam. It retains its full plasticity but a few minutes only, and must, therefore, be used quickly.

## Reports of Society Meetings.

### NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, February 20, 1894, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, Dr. Brockway presiding.

The Secretary, Dr. Starr, read the minutes of the November meeting, which were approved. He also read the minutes of the January meeting, which were likewise approved.

#### INCIDENTS OF OFFICE PRACTICE AND CASUAL COMMUNICATIONS.

Dr. George Allan presented an electric mouth-lamp, described under proceedings of Odontological Society of Pennsylvania.

Dr. Wilson then read the following incident of office practice:

A French gentleman, aged about forty, for several years a patient of mine, came to me with the left side of his face, particularly the lower part, swollen very badly—so badly, in fact, that the skin seemed ready to burst. I was greatly surprised, knowing that his teeth on that side above and below were all sound.

An examination—such as could be made, for he could open his jaws but very little—revealed nothing except that about the lower wisdom-tooth the gum was somewhat swollen and inflamed, the tooth itself being only slightly sore to touch. Intuitively, perhaps, I fixed upon that wisdom-tooth as the cause, and advised him that safety from external fistula and eschar of the face, in my opinion, depended on immediate removal of that tooth. Dr. Hasbrouck succeeded in extracting it that same afternoon, how, I can scarcely imagine.

The next day the patient called on me with his face much reduced in size and a very formidable-looking wisdom-tooth in his vest pocket. It had a long bifurcated root extending backward, with a sharp curve upward. Some considerable discharge from the opening followed, but by frequent use of warm extract of witch-hazel and listerine injections with a curved-pointed syringe, the swelling rapidly subsided, and in a few days everything was on the way to recovery.

The interesting feature of the case to me was what should cause such a disturbance after many years of constant use, for he had his full number of teeth above and below, all occluding perfectly



and all perfectly sound, the extracted tooth itself having no sign of any decay or disease about it.

*The President.*—Was the tooth thoroughly erupted?

*Dr. Wilson.*—Yes, so that it occluded perfectly with the tooth above it.

*Dr. Payne.*—Last week, the hour was so late when the matter of retaining lower incisors was discussed, that I did not say anything on the subject, but I had something to say about it, and I have written it down.

Under the head of "Casual Communications" at our last meeting, Drs. Davenport and Rhein referred to their method of retaining in place loose lower incisors.

Both methods, if I correctly understand them, held the six lower teeth in a sort of block or rigid condition. I object to any appliance which interferes with the normal movement of teeth. Scientific treatment of natural organs should, as far as possible, conform to natural laws. The movable condition of teeth is an admitted fact. Hence any appliance which holds firmly a movable organ more or less contravenes a natural law. Therefore, I regard rigid appliances less desirable than those which I will describe.

First, I would, if I used the bar at all, form the groove without an undercut, and polish it until it is perfectly smooth. Then accurately fit a gold and platinum bar and anchor it firmly to the cuspids. If the bar is well adjusted and firmly anchored, the teeth will be held in place, and the trouble and annoyance of filling in the loose teeth giving out entirely obviated. We all know how fragile is the end of a lower incisor after an undercut is made sufficient to hold a gold filling around the bar. By leaving the bar loose in the groove greater strength is left to the tooth, and a little movement as in nature is possible. If objection be raised that caries will play an important part, I will say that experience teaches me that such grooves properly polished do not, as a matter of fact, become carious, if at all, in a long time. It will be remembered that at the age such resort is necessary the teeth are dense compared to younger teeth, and besides they are in constant use. I have abandoned the bar over the cutting-edges, but if it is thought desirable to make use of it, I recommend its use in the modified form above indicated.

The method which commends itself as the very best known,—to me at least,—and one that I am tempted to claim to have originated, is to carefully adjust a flattened, highly-polished bar to the posterior surface of the teeth about one-sixteenth to one-quarter

of an inch below the top, and to this bar solder fingers of spring gold after the manner of the gold fingers used to hold precious stones. These fingers should be left pointed and straight until the piece is properly adjusted and firmly anchored to the cuspid teeth, then with pliers close the ends of the fingers, not too firmly, but so as to hold the tooth. The gold will show very little indeed in front, as it comes only far enough forward to hold the tooth when the ends are set up with pliers. The piece can be attached to the cuspid teeth with a clasp, or retained in the usual way by cutting a cavity for a gold filling.

An advantage of this method is the absence of the weakening groove and the unsightliness of the bar, or the gold caps referred to by Dr. Davenport; and what is all-important, it does not, as a slight movement is possible, essay to improve on nature. I regard rigid appliances objectionable, and their usefulness for any great length of time questionable. So many bridge-work pieces split on this rock, that at present bridge-workers are adjusting movable pieces, which show that the foregoing law cannot be disregarded without a penalty. I therefore recommend this method as the very best I have ever employed for the purpose.

*Dr. Jackson.*—There are two methods of retaining teeth that have become loose from pyorrhœa or other cause that I practise successfully, to which I would like to call the attention of the Society. The first is a method of grooving the approximal sides of a loose tooth (I am now speaking of a lower incisor), which is done with a thin corundum disk, and rounding the approximal surfaces of the adjoining teeth so that they will fit into the grooves, then springing the loose tooth into position, and retaining it there with a ligature around the adjoining teeth until they remain in contact with it.

This method is especially valuable where there is a tendency for the teeth to become irregular from crowding. One case I have in mind was where the superior incisors had been biting inside the arch. The patient was thirty-eight years of age. After moving the superior incisors in front of the lower ones, it was necessary to support the loose incisor in some way, as it was found that, as the superior incisors pressed against it, there was a tendency for the teeth to crimp. I anticipated this condition, and told the patient I would groove the sides. I did so; the tooth is firmly held, and with a little attention to the gum, I think we shall keep up this healthy condition for some time.

The second method is to use "crib" attachments, and arrange a bar on both the labial and lingual sides of the teeth, the ends of

which should be attached by a "crib" attachment to a first bicuspid on each side of the arch.

In Dr. Payne's method, the attachment of springs could extend from a bar on the lingual side of the appliance such as I have described, and do away with the bar on the labial surface. It could be slipped on and off easily and cleansed by the patient, and the anchorage is perfect. The bar in front is a practical method, and can be made in twenty minutes.

*Dr. W. B. Davenport.*—I do not claim any originality for the following few notes of a very interesting case which I had. Its obstinacy, and its being slightly out of the ordinary character of cases, attracted my attention.

The following case of subperiosteal abscess in the roof of the mouth was brought to me for treatment. An examination revealed a fistulous opening on the alveolar ridge where the left superior lateral incisor had been, and a large swelling covering the hard palate on the left side of the median line.

The slightest pressure upon this caused a copious flow of thick, yellow pus from the fistula. The patient was in a weak condition and suffered from insomnia, nervousness, and loss of appetite. I obtained the following history:

About six years before, the pulp having been destroyed, the tooth was filled with gold. The patient remembers that the probing of the root-canal caused acute pain, but the tooth was comparatively comfortable after that for about five years, being sensitive, however, to cold and sweets. Suddenly, soreness of the tooth was noticed, and then a small pustule appeared on the labial face of the gum. Soon there was a discharge of pus from this which continued daily for six months, when the swelling appeared in the roof of the mouth, and the patient, becoming discouraged, had the tooth extracted. Instead of the relief expected, the discharge of pus from the alveolus not only continued, but increased in frequency and amount, and the swelling on the palate became larger. The pain was very intense and involved the entire left side of the face.

A physician was consulted, who lanced the swelling twice, but employed no medication.

The case came under my notice six months after the extraction of the tooth. At that time the abscess was discharging three or four times a day an amount of pus sufficient to saturate a handkerchief. My treatment was as follows:

Seeing the patient daily, I evacuated the abscess by a firm pressure with the finger, upward and forward, and syringed it with a

1 to 5000 solution of bichloride of mercury. Repeating the upward and forward pressure on the roof of the mouth, the solution would return mixed with pus, when I would syringe it again and again evacuate the sac by the means described, until the solution would return clear. The mouth of the fistula was then plugged with cotton. This was continued daily for two weeks when an improvement was noticed; but on relaxing the treatment the abscess returned to its original condition. During the next twenty-three days the treatment was unavoidably irregular, being performed for some time by the patient herself at home, after I had instructed her in the use of the syringe, and also by myself at the office.

The entire time of treatment was a little over two months, the bichloride solution being gradually reduced in strength, until at last the 1 to 10,000 was used. At the beginning of the treatment the probe could be passed in to a depth of one and a half inches. At no time did I find any loose pieces of bone.

This case strongly illustrates what a simple alveolar abscess may become, if neglected, and the importance of thorough, regular, and continuous treatment at the outset. It was also evident that the pus had burrowed along beneath the periosteum, which it had finally penetrated, and involved the submucous tissue at the point of the swelling. At this date, many months after the patient was discharged cured, the parts are still in a normal condition.

*Dr. S. G. Perry.*—I have always distrusted matrices, and yet I have probably used them as much as any one in the profession. I am afraid of them because they prevent access to the cavity, and render the adaptation of the gold to the margins a little uncertain. In the use of plastics, of course, this objection does not apply. I aim to be supplied with a great variety of them, so that I can make a prompt and suitable adaptation to any case. Some time since I showed before this Society some thin steel matrices soldered to a handle and having on one end a lug, which, resting on the adjoining tooth, insured a good fit. I have here a thin steel matrix soldered to a handle, and having on its free end the equivalent of two lugs, so that it can be used between two teeth and will fit each, so that the fillings can be put in on each side at the same time, and when the matrix is removed the fillings will both be contoured. I have here also a matrix with the equivalent of the double lug on both ends, but made so as to be adjustable with a screw. Tightening the screw brings the double lugs together until they fit on both sides of the teeth. Loosening the screw enables one to spread the lugs

and remove the matrix. Of course, the lugs are filed to fit the contours of the teeth. This is a matrix that will not be often used, but it has its place among the many that can be used to advantage.

Here is a simple matrix which I use when the inner cusp of a bicuspid is broken away, and the two proximal surfaces and the lingual side are to be filled together. It consists of a simple band of steel bent about the tooth and cut away freely on the lingual side of the tooth, to allow access to the two cavities. It confines the plastic filling so that when pressure is applied on one side, the filling does not bulge out on the other. Of course we all know that the quality of an oxyphosphate filling is improved if it is put in a cavity that will hold it while pressure is applied to it, so as to condense it before crystallization occurs. With this style of matrix a filling can be put on the three sides of a tooth with one mixing of the cement. It is too simple to show before this Society, as doubtless many use it in the same way, and yet a man long in practice told me in my office the other day that he had never seen such a matrix used, and that he had been greatly puzzled with the cavities I have described. I show it now, thinking that possibly some one may get a hint from it. I have also here a little strip of rolled gold, about No. 60, which I have used many times as a matrix while filling the front teeth with gutta-percha or oxyphosphate. I suppose with this little piece of gold, used as a matrix, I have filled over fifty teeth. I slip it between the teeth and bind it close to the outside of the tooth I want to fill, and away from the inside of it, so as to allow access to the cavity, which, of course, is generally opened on the inside. I hold it on the outside by the finger while pressing the filling in place.

*Dr. Allan.*—In all cases where the gums are spongy or bleed from any cause, I think a drop of murelene is very good. It stops the bleeding quicker, and does not leave a black deposit that you have to wipe out again. I don't know the nature of the compound, and cannot say anything about it, except that I find it exceedingly useful. It works quicker than any other styptic with which I am acquainted.

*Dr. Francis.*—Does it test acid?

*Dr. Allan.*—I don't know. Now and then patients complain that it gives them pain, but those patients complain of anything I use; so I do not think it is really objectionable. I hope I emphasized the fact that the idea of the electric model I showed you was taken from Dr. Van Woert.

The paper of the evening was then read by Dr. Charles F. Allan entitled "Eclecticism, the Best Conservative Practice."

(For Dr. Allan's paper, see page 294.)

#### DISCUSSION.

*Dr. Francis.*—In the course of our lives words sometimes come to our ears that leave an indelible impression upon our minds. At a meeting of the Odontological Society some years ago, where a large number of dentists from different parts of the country were present, the subject of "filling-materials" was largely discussed. There were advocates of soft foil, cohesive foil, sponge gold, amalgam, gutta-percha, etc. Towards the end of the discussion, a gentleman much esteemed in our profession made this remark: "If you thoroughly prepare a cavity for filling and wish to preserve the tooth as long as possible, the best material to use is *good judgment*. Of course, you can deduce the moral.

In regard to Dr. Allan's paper I will simply say, that I listened to it with great interest and fully endorse it throughout.

*Dr. Perry.*—I do not think the paper is one that can be discussed. It commends itself so forcibly to one's common sense, that there is really not much to be said about it, except to commend it. I think, however, that Dr. Allan emphasizes a little too much the importance to be placed upon the fact that a few men do not use amalgam, and are not met with that sweeping condemnation that would be expected. I think the members of the profession are not outspoken on that subject, because they think it is not worth while. I suspect that was the reason that question was not discussed more fully in Chicago, and I think that is why it is not discussed in our societies. There is an undercurrent of common sense in our profession that will not tolerate extremes, and it is useless to try to convince most men that amalgam has no place in dental practice.

One or two points in the paper I wish to speak about. Dr. Allan favors the use of crystal gold. There never was a time in my practice that I have not used it to quite an extent, and I think in later years I have used it more than before. As for cohesive gold, of course I use that, but rarely from the beginning of the cavity to the end. I commence almost all my fillings with the softer forms of gold, using mostly Morgan & Hasting's gold for three-quarters of the filling, finishing off nearly always with crystal gold. I think a good surface can be secured more easily with that, and a better finish. The use of the matrix is very helpful for those

soft forms of gold, but is not to be much trusted with the strictly cohesive.

*The President.*—We should like to hear from visitors who are with us to-night, and I will call upon Dr. S. B. Palmer.

*Dr. S. B. Palmer.*—I have very little to say in regard to the paper under discussion, and merely rise to express my gratitude at being with you. I had received a notice, and I did not know that I could pass the evening more agreeably than by coming here. I am very much pleased with the paper. I will speak further later in the evening.

*Dr. Parmley, of Hartford.*—In mentioning the case of putting this extra burden on nervous and anæmic children, it brought one case forcibly to my mind which I have seen in the last six months. The use of the rubber dam, not entirely for the benefit of the patient, but for his comfort as well, struck me forcibly. I have quite often heard patients express their delight that we had discovered something to take the place of the clumsy napkin that was formerly so generally used, and still is by some.

*Dr. Palmer.*—I wish to refer to the electric battery and the cautery point. I use it for drying the root-canals. I would make a suggestion that with the loop at the point, you solder in some of the spring gold, or clasp gold wire, and make it fine so as to enter the nerve-canal. I use that in preference to copper or silver. You require a stiffness to the point similar to steel, and this can be made quite fine. The point of heat is below at the forks, and it only communicates the heat to the little broach that enters to the end of the cavity with a pumping movement. It thus takes up the moisture and immediately evaporates it. You can dry the canal thoroughly as far as the point can be made to enter. The patient will tell when the tooth is warm enough, so there is no danger of overheating. You can bend the broach so as to enter the canals at various angles. In regard to the filling, when the canals are properly dried I take paraffine and harden it with some resinous gum, place a little in the cavity, and on touching it with the heated point it goes home to the root. I first used copper points separately, heating with a dull point, but would have to pull the point back with another instrument. By having two or three different curves, you can change them instantly. One cautery should be blunt, merely the wire loop. To complete the filling have copper or silver points (I prefer pure silver), coat them with paraffine, place in canal, and touch the end with the heated loops. It will go home, and if you ever have occasion to remove it, a mere touch of the excavator will take it

out. I generally take eucalyptus or oil of cinnamon and put it at the apex, and then pass in the point and volatilize it as much as possible. One lesson I learned from that, and that was how imperfectly I could dry a root. How much we think we do, when we really do not! My method of doing it was to take a little glass straw, hold it over the Bunsen burner, draw apart, break, and have two artificial root-canals. You will find it a very difficult thing to dry them in. When you first apply the broach they will hiss and boil, but by perseverance you will succeed in drying them. If you use the paraffine, the canal is filled perfectly. I put it in and then fill over with whatever I wish,—chloro-percha or phosphate. I have been most successful with this filling. It is the most accessible in case of trouble.

*Dr. George Allan.*—I have not had this battery long enough to experiment with it in all ways, but I desire to call attention to one thing,—Dr. Palmer having drawn your attention to it,—drying cavities previous to filling. Many of you have heard of obtunding sensibility by using a current of hot air. In two or three cases where I have tried this cautery point,—imperfectly, I acknowledge,—I have found that I obtained very excellent results. Approaching the point to the sensitive dentine in the cavity, I find I can obtund the sensibility to a great extent, and with little pain to my patient. I think that, when it is more thoroughly understood, it will supersede the hot-air current. It is vastly more convenient to use. There is no harm in drawing your attention to it, although I have not experimented very much with it myself. It will dry a cavity with marvellous rapidity and thoroughness. It seems to me it can be used to great advantage by a dentist.

*Dr. Brewster.*—I would like to ask Dr. Palmer, or Dr. Allan, if they have used calium natrium for drying cavities, and if they consider this superior?

*Dr. Palmer.*—I have not.

*Dr. Allan.*—Neither have I.

*The President.*—I think the object of that is not to dry cavities.

*Dr. Brewster.*—I understood at Chicago that it was used for getting moisture from the canals.

*Dr. Allan.*—A method I have employed in drying cavities makes use of the same principle adopted by microscopists in preparing mounts. The section or object in water, or some aqueous fluid, is transferred first to alcohol, which abstracts the water, and then placed in the balsam, which in turn is miscible with the balsam. So by the use of absolute alcohol all the water in the root-canal can



be abstracted by repeated applications, and then the alcohol, being very volatile, can, by means of the hot-air syringe, be quickly evaporated and the root-canal left in not only a state of complete dryness, but also in an aseptic condition.

*Dr. Perry.*—It should have been said that our President was the first man to call attention to the advantage of using hot air. Where the pulp has been recently devitalized and removed, I think we can fill a tooth with a permanent filling and have no anxiety; but there are a large number of teeth which we can recognize instantly that have been dead for a long time, where there is no certainty of filling them permanently. My method has not been that of Dr. Palmer, but rather the use of a fine piece of gold wire, used with ohloro-percha formerly, and later with the chloride of zinc. The little wire can be drawn out and give easy access to the root. I think a great deal can be said about the paper after all. I hope we shall hear from Dr. Bogue and Dr. Howe on the subject. This Society stands for conservatism, and I hope we will hear from them.

*Dr. Bogue.*—There was one remark in the paper that caused me to put down a little note,—it was in regard to the teeth that were tender from wedging, and which became, as he operated upon them, more and more tender, and more and more difficult to work upon. I felt very much like asking Dr. Allan if he does not use a separator and keep them steady, and so avoid the pain. The second thing Dr. Perry has fully answered, which was in regard to crystal gold, which has a surface that can scarcely be excelled. Its adaptability for that purpose is marvellous. I also felt like calling Dr. Allan's attention to the fact that a committee was appointed many years ago to test the relative merits of crystal gold and foil. I happened to be on one of those committees. The result was that many teeth were filled partly with crystal gold and partly with foil. After many years, when one of these teeth came into my possession broken in two, I found the crystal gold and foil equally good, and well adapted to the walls of the cavity, but the crystal gold had taken twice as long as the foil to insert, and the difference in efficiency was not perceptible.

I want to make my thanks to Dr. Palmer, for he has shown to me a new and what seems to me a very good method of filling roots. I have for many years used oxychloride, introduced on a few wisps of cotton wound around a broach, and passed to the end of the canal, leaving the cotton there. I want to ask Dr. Palmer if I understood that in the event of wishing to get at the apex of a root filled with paraffine, on withdrawing the silver wire there is a cer-

tain thickness of paraffine between the end of the wire and the apical foramen?

*Dr. Palmer.*—You take a Donaldson broach and hook it on. The end which is in the pulp-cavity is bent at right angle to assist in removal; it is not in the way at all. Where the root is absorbed, if the opening is very large, get your measure and then bend the outer end of wire you use until it goes in even with the end of the root. Take the measure so as not to have the filling pass through. The paraffine will fit in and there will be a good filling without having it thrust through.

*Dr. Parmly.*—Is paraffine a new material for the filling of roots or has it not been used before? I am very certain that Dr. Tomes many years ago recommended paraffine, but he used it in a different manner.

*Dr. Palmer.*—I do not claim anything new for it. It has been used before.

*Dr. Perry.*—Is there any deterioration?

*Dr. Palmer.*—The batteries used by the telegraph companies are found to be ahead of nearly all the others for the use which they claim. They use paraffine entirely to insulate the wires. The whole wire is passed through paraffine. I think they know whether it deteriorates or not. I do not believe it does.

I prepared those glass tubes, and also took specimens of teeth and dried them and filled them. Take a tooth and put it in water then cut it open. In experimenting with paraffine, color it with vermilion. You can then see what you are doing; also when you split the tooth open, you will know whether you have it perfectly not.

*The President.*—Inasmuch as Dr. Perry mentioned the subject I may be permitted to say in reference to the use of heat for obtaining sensitiveness, that while I do not know that I was the first to call attention to it, I did call attention to it a great many years ago in a paper read before the Brooklyn Dental Society. I practised this method for many years. I was led to think of it from the fact which I had observed, that where the rubber dam had been on for some time the teeth became very much less sensitive, and I argued that it came from the drying of the contents of the tubuli, so that the sensation could not be conveyed so readily. Acting upon that I improved upon it by using hot air injected into the cavity. I do not use it as much as formerly, because I have the habit latterly of preparing my cavities under a jet of water, which has the double purpose of washing out the bur, keeping it clean and

cool, and seems to me to somewhat relieve the disagreeable jarring of the bur. At least, I find comparatively little complaint on the part of patients now of the pain of the operation. I would like to correct Dr. Brewster in regard to the use of kalium-natrium. The use of it was not intended for drying the cavity, but to cleanse the contents of the pulp canal. It does that instantly almost, by changing the putrid contents into soft soap, which can be washed out readily with hot water, and then any means of treating can be adopted that is preferred. I see this method of Dr. Palmer's is an improvement on that of Dr. Evans's root-drier, and I should think it would be very effective.

*Dr. Bogue.*—Following your suggestion of hot air, if the air before being heated is passed through a receptacle containing chloride of lime, which has a strong affinity for water, the air will come into the cavity largely deprived of its moisture; so, being both dry and hot, its work will be more efficient. One must not expose this air to the patient's respiration.

Motion of Dr. Francis for vote of thanks to Dr. Allan unanimously carried.

Adjourned.

JOHN I. HART, D.D.S.,  
*Editor New York Odontological Society.*

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## AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, on Wednesday evening, January 3, 1894, at six o'clock, President Smith in the chair.

*President Smith.*—Gentlemen, we come now to the subject of the evening, "Crown- and Bridge-Work." The subject will be opened by Dr. Cecil P. Wilson.

(For Dr. Wilson's paper, see page 303.)

### DISCUSSION.

*Dr. Wilson.*—Dr. Moffatt, the other day, as a matter of experiment, coated several teeth with enamel, put them in a Parker gas furnace, and baked them eight minutes, subjecting all to exactly the same conditions. The kinds of teeth experimented on were as follows:

(1) Howard & Tucker. The body of this tooth is composed of eight pennyweights of silex, twelve pennyweights of spar, and twenty grains of clay.

(2) S. S. White Dental Manufacturing Company.

(3) Johnston & Lund.

(4) C. Ash & Son.

(5) The old Stockton tooth.

The tooth from C. Ash & Son apparently made the poorest showing. It was all puffed up, and had entirely lost its original shape and color. It looked like a lady's button more than anything else. The teeth made by the S. S. White Dental Manufacturing Company and Johnston & Lund came out very well. The old Stockton tooth, so much used in years gone by, did fairly well, but the gum enamel was faded and looked very glossy. The old Howard & Tucker tooth stood the test best of all. I have no right to say that the Ash tooth is any less durable in the mouth than the other teeth.

*Dr. Williams.*—There are two points on which I think something might be said. I was glad to hear Dr. Wilson say that too soft gold must not be used where there is any strain. I found some time since that the finer gold is too soft. I tried those bands that are graded in sizes and sold by the S. S. White Dental Manufacturing Company, but, after getting them fitted, I found in two or three cases that they stretched, and so gave them up and have since made my own bands of stiffer gold.

I have not heard mentioned in reference to bridges one cause of irritation of the roots, which seems to me a very important one. This irritation is generally supposed to result from the bands or crowns being too far up. There is another cause, and it was this which led us, in 1844, to discourage extensive bridge-work permanently fastened to several roots. If you take an impression of the strongest set of teeth in the mouth of a man in good health and medium age, and make an accurately-fitting plate, and let the patient wear it a day or two and then take it off and leave it off for a day, when he comes to put it on again he finds it goes on a little hard at some particular point. If the plate is left off two or three days it does not fit as it should. What is the reason? There is in the average set of teeth a little swinging, swaying movement, or life, as it were. Each tooth is changing its position with, however, only a very slight movement, and has a different relation to the other teeth from day to day, and perhaps during the same day. That natural movement—you might say elasticity—of the row of teeth, if rigidly held in check by a metal plate fastened to the teeth,

produces a strain which is often the cause of premature loosening of the roots. The teeth do not have freedom of exercise, so to speak, when held firmly by a rigid fastening. If that fact were taken into account I think there would be a little less use made of extensive pieces of bridge-work permanently fastened in the mouth. The first piece of work I had given me to do in order to get my hands trained, when I was studying with Dr. Keep, was to carve out of sea-horse material, such as had been used for artificial teeth in the early stage of the art, six front teeth which it was intended to pivot to several roots. This pivoting was, of course, open to the objection of being firmly held, and that was a part of the experience which led me to see the discomfort of extensive permanent cases of bridge-work. The principal is all right if you apply it judiciously, but I prefer, if possible, to have such appliances removable.

*Dr. Brackett.*—It has been said that one of the most delicate and graceful compliments that an author can pay a friend is to give him a copy of his book containing a specimen of his writing, and that in the same way it is evidence of high esteem for a painter or an artist of any kind to present something that he has himself done in the line of his work. And so also social economists and students of moral philosophy say there is no high and true charity that does not involve the giving of something of one's own self; that the mere bestowal of money or something of that sort that may be done carelessly, without taking an active interest, is not true charity. It seems to me that the essayist to-night has in the highest and best sense put before us that which is most complimentary and helpful to us and most honorable to him,—that he has been rarely good to us, and of that in itself I wish to express my high appreciation, and I am sure that every one in the room has the same feeling.

Further than that, I wish to express my admiration of the general good sense and moderation of the paper. The purport of it is that bridge-work in itself has great merit when judiciously used, skilfully constructed, and properly applied. And this is decidedly my own feeling out of some experience not large, but very gratifying. I think we find generally that it is along these lines that the value of all meritorious things lies. Whether we contemplate some particular kind of filling-material or some ingenious contrivance, a very great deal of the success lies in the good judgment and wise discrimination of cases in which it is used, and the skilful adaptation of means to ends. I am especially gratified to have been pres-

ent this evening, and to have heard a paper which seems to have put before us the man himself in the most generous, kindly, and brotherly way.

*President Smith.*—I want to ask Dr. Wilson what was his method of fitting clasps to the supporting teeth?

*Dr. Wilson.*—I first took an impression of the gold crown in plaster, into which I poured fusible metal. To this die I fitted accurately a band of twenty-carat gold, No. 30 gauge. I then made another band of clasp metal and soldered the two together. This made a perfectly-fitting clasp. I do not think, however, I should recommend this sort of clasp for all kinds of cases. In this case of mine the clasps slip into their places very easily. In cases, however, where the teeth are irregular in shape, and the clasps must be sprung into place, the ordinary clasp metal alone must be used.

*President Smith.*—Do you solder all the teeth and the clasps at one bedding, or in parts, and then unite the parts?

*Dr. Wilson.*—I think the proper way to construct a piece of this kind is to make it in sections. The first section included the four incisors, then the other two sections were made, an articulation taken, and the teeth soldered together. The case was made in three sections, just as though it was three different pieces of work; each piece was soldered separately and they were placed in the mouth, an impression taken of the whole, and all joined together.

In making the case that I have in my mouth I made one complete plate, as I thought it would save a little time. The result is, I can feel that the fit is not so accurate as it would have been if I had made it in sections. I venture to make the assertion that it is absolutely impossible for any man, no matter how skilful he may be, to so heat up a plate that it will fit just as it did before the heating took place. There must be a little warping, and more or less expansion and contraction during the heating-up process. These molar blocks were backed up and soldered separately. The backings were well covered with solder, so that when they were finally placed in the investment it required but a little solder to join the pieces together.

*Dr. Williams.*—I would like to ask Dr. Wilson if there would be any objection if, in striking up this plate, he strikes it up in one piece and then divides it and makes each part separately?

*Dr. Wilson.*—There is not the slightest objection to striking up the whole thing at once and then dividing it, but I happened to strike it up separately.

*Dr. Williams.*—Of course, if they were to be struck up in one piece, they would require another fitting after the dividing.

*Dr. Wilson.*—Certainly. I might say still further that this is not Dr. Richmond's method of doing this kind of work. He uses pure gold and burnishes it down either on a metal or a plaster cast, and in that way avoids the necessity of striking up a plate. He is very skilful and does his work very nicely.

*Dr. Moffatt.*—I would suggest that Dr. Wilson explain the method of taking the last impression of the different pieces which are to be joined together in the mouth with perforated tin.

*Dr. Wilson.*—If I wanted to join two pieces, I should wax them together on the model and place them in the mouth. In order to get an accurate impression of these teeth, I use a piece of perforated tin such as is used in the making of kerosene lamps or coffee-strainers. This idea I got from Dr. Richmond, of New York, though I do not do it exactly as he does. He uses thin brass, the holes in which are quite large. You can bend the tin in any shape, and the holes allow the surplus plaster to go through, and yet the tin holds the plaster in place.

*President Smith.*—The perforated tin serves as a cup, and you bend it into different forms.

*Dr. Moffatt.*—You can get the perforated tin from the Dover Stamping Company, on North Street, Boston. There are various thicknesses, and it takes but a minute to bend it into any desired shape, and fasten any cuts or corners with a little soft solder.

*Dr. Baker.*—I would like to ask Dr. Wilson how he grinds the tooth, or shapes the root, to make the cap go over it. What method or what instruments does he use?

*Dr. Wilson.*—I use a corundum wheel.

*Dr. Baker.*—But in cutting under the gum,—in making the parallel surfaces on the molar and bicuspid in the case you exhibited,—do you use root-trimmers such as are sometimes used for putting on a Richmond crown?

*Dr. Wilson.*—The conditions are favorable in the case presented for a perfectly-fitting crown. You will remember I intimated that when I said it was possible to make a perfect impression of these teeth. If they were bell-shaped, a perfect impression would have been impossible.

*Dr. Potter.*—What instrument do you use to trim the edges off above the gum, so that the cap will fit all around? The collar is supposed to go up under the gum.

*Dr. Wilson.*—I use a scaler very much like a scythe. You can get down under the gum with that and cut off the edges. And then I use a fissure bur a good deal.

*Dr. Ainsworth.*—This is a very interesting subject, and opens a wide field for discussion. I wish, in the first place, to thank Dr. Wilson for the practical illustration of it. His testimony must be of value. As to the preparation of the root for the band, I am not aware that I have any different methods from those in use by others. In cases where the root is badly decayed or unfortunately broken, it becomes a difficult and many times a trying ordeal for the patient and operator.

In typical cases, however, of the upper bicuspid, where the crown is cut off and everything favorable, I use a stiff shank hoe-scaler for the larger part of the work. These instruments, as they usually come to us, are susceptible of much improvement by a little careful grinding on a small corundum wheel. The S. S. White Dental Manufacturing Company has recently brought out an obtuse-angle scaler which seems much nearer the acme of perfection than anything heretofore at hand. The operation, if painful, is made much more bearable by frequently dipping the point of the scaler in strong carbolic acid, aiming to interfere as little as possible with the periodontal membrane both in the preparation of the root and the adjustment of the band. I usually make the band from a piece of plate while the patient is in the chair, bevelling the edges as they are brought together and soldering. The size is easily determined by tying a ligature around the corresponding tooth. For instance, supposing the tooth to be crowned is a first bicuspid on the right side. If the first bicuspid on the left is in good condition, I would pass a ligature around that, cut, and remove, and thus have a perfect measurement for the required band. A tapering mandrel is the next important auxiliary. I have a very convenient one in a small steel rod that belongs to my great-grandmother's spinning-wheel; it is, perhaps, eighteen inches long and of a convenient diameter. If the band is a trifle small, it is easily enlarged by placing on the mandrel and tapping it gently with a small hammer. If too large, the edge under the gum-line is easily made smaller by the use of the crimping-plate designed for that purpose.

Dr. Wilson spoke of the difficulty of fitting a gold crown accurately under the gum. I have found much satisfaction in constructing a molar crown in this way: Prepare the root as best you can for the reception of the band, which should be wide enough to



represent the height of the finished crown. Shape and fit the band nicely, crimping the edge which goes under the gum so that it will take a firm hold of the root at that point. Then select a porcelain top, such as are on the market, with two small pins on the under side, and fit that into the band, and grind to a proper occlusion with the opposing tooth. When this has been done place the band firmly on the roots, applying the dam, and set the top in cement, allowing the patient to close the teeth and bring it to place. This gives a crown less gilded in appearance and in every way satisfactory, and there is the advantage of being able to see exactly how a crown band fits under the gum.

*President Smith.*—As Dr. Baker asked the question of Dr. Wilson in regard to trimming roots preparatory to putting on a band, I would like to ask him if he has any particular method for trimming roots?

*Dr. Baker.*—The reason I asked the question was because I always had great difficulty in doing that part of the work, and, seeing these teeth adjusted so nicely, I thought he must have some special way of doing it. I have tried the various instruments for sale at the dental depots and they work fairly well, but I would like something better if it were possible to get it.

*President Smith.*—I would say that Mr. Heald, who manufactures burs in New York, takes your old broken burs and makes a fine-pointed fissure bur having the shape of a fine cone. This is a very nice thing for preparing a root for the reception of a band. I have read somewhere of a mechanism for this purpose which is attached to the dental engine. It consists of a file with an up-and-down motion.

*Dr. Wilson.*—I have no doubt that a great many gentlemen here can cite cases where all-porcelain teeth have been worn, doing service for a number of years. I recall one case of a lady who wore a porcelain tooth for twenty years; it was secured by an old-fashioned wooden peg set in rubber cement. That, of course, is an exceptional case. There is an instance in my own family where an upper left lateral incisor has been worn for seventeen years. It was a plate-tooth, with gold backing and pin, like a Richmond crown with the exception of the band. It has been reset two or three times during that period and has done good service. Because of these two excellent results, however, I do not consider that the all-porcelain tooth is best. Dr. Tucker, Dr. Williams, or Dr. Preston can show you a great many excellent gold fillings that were put in without the rubber dam and all the other accessories of the present

day; but it does not follow that that is the best way of placing in a filling. It seems to me that the Richmond method is the best which is known to-day of fitting on a crown. The difficulty of the operation is a disadvantage, and I sincerely wish I could find some other way of crowning teeth that would be less exacting and yet be fully as serviceable.

There is one thing I would like to ask some information about. I have made crowns in the old-fashioned way with gold or platinum pins, and set them in the teeth with gutta-percha. I have wondered a good many times whether the gutta-percha does not swell and split the roots. I cannot say that I ever saw a root with a crown on it that I could absolutely say was split because of the gutta-percha, but I have a case in mind where the root was filled with gutta-percha and where there was no occlusion, and it was split directly open, and I could not attribute it to any other cause than the swelling of the filling.

*Dr. Williams.*—How large a canal was it, and what class of gutta-percha did you use,—the soft or the dense kind?

*Dr. Wilson.*—I don't remember much about it now. It was some years ago, and I simply recall the fact of finding the tooth gaping open. It must have been the soft kind, because we did not have at that time the dense gutta-percha such as is now used. You understand there was no occlusion and the root had no crown at all on it.

*Dr. Williams.*—The softer kind is elastic and will expand, and is especially liable to do so during mastication of food, whereas the denser kind is not so liable to spread. There is danger of capping pulps with this soft kind on account of its yielding tendency. *Dr. Wilson* spoke of the durability of teeth set in the older style. I remember a case of an elderly lady who had a porcelain tooth which was occupying the place of the upper right canine, the crown of which had been accidentally broken off. The root had been crowned in the old-fashioned way twenty-eight years before with a simple wooden pin,—hickory, I think it was,—but the crown was nicely adapted to the root and there was very little strain against it. Every circumstance was favorable to the tooth, and the lady wanted me to promise her that it would last thirty years. I put in the same tooth with a new pin, and seven years after that it was still good, so that I know she got thirty-five years use of that old-fashioned tooth.

*Dr. Cooke.*—There was one point which *Dr. Ainsworth* brought out that I did not quite agree with. He spoke of having the band

crimped, so that the lowest part of the band would take a firm hold of the root. I tell the students at the dental school that if they wished to fit a ferrule to a fishing-pole, they would want to have that ferrule fit at all points; and so you must have your band come down parallel with the root and get a substantial friction hold.

Dr. Wilson spoke of the disadvantage of using crowns already in the market, and I thoroughly agree with him. I also agree with him in regard to what he said about the necessity of fitting the crown in the mouth instead of to a model. Unless I can have the band tight enough so that the finest Donaldson broach cannot pass between it and the root, I do not think I have got the band to fit as it should. In regard to irritation from a band, there is no reason why we should have it, provided the crowns are fitted with a reasonable degree of accuracy. When I have heard of a case where there was irritation, I have always made up my mind that the trouble lay in the crown not fitting.

There is one point that I have not heard referred to, and that is the building up of the thin edge of a root with amalgam. We sometimes have only a small portion of the root on which we can secure our band, and when a little absorption goes on, the gum recedes and gives an opportunity for the lodgement of food, and then decay begins underneath. In such cases I build up with amalgam and polish the edges, and then carry an all-gold crown over all.

*President Smith.*—I wish to say, in regard to the possibility of gutta-percha splitting the roots, that I am of the same opinion as Dr. Wilson. I have reached my conclusion from observation, and so strong is that conclusion in my mind that I do not fill canals with gutta-percha, but set the pin with some of the cements.

In measuring for a band I use a silk ligature, carrying it around the root once and cutting at the point of intersection. I never cut the band any longer than my measure, and generally a trifle less. I never lap a band. In that way I think I can get a more accurate fit.

*Dr. Clapp.*—I did not think of saying anything to-night, but Dr. Cooke spoke of dressing up with amalgam badly-decayed roots, and that awakened tender memories of my own case. A good dentist of this town has been operating on some bicuspid in my mouth. They were badly broken down and it was necessary to do something to strengthen them before crowns could be put on. I am unfortunate enough to have gums so sensitive that there are not adjectives enough in the English language to describe the condition. The work on these roots left memories that will be lasting. The method

which that gentleman used was to fit very thin platinum bands to these roots. The bands extended a little way below the gum and were fastened to the roots with cement. Howe posts were screwed into the roots and also set with cement, and then the bands were filled with amalgam. This operation was done about a year ago, and when the gentleman gets time, and I get time, I hope gold caps can be put on without much further suffering on my part. The bands are to stay there, and the gold caps, when they are made, are to be fitted around these bands; and I trust, when Dr. Stevens puts the gold caps on, he will not have to interfere with the gums as much as he did last time, although he did it with the greatest possible care.

*Dr. Andrews.*—I would like to ask Dr. Stevens what amalgam he used in filling in those bands?

*Dr. Stevens.*—Blackwood's White Alloy. In regard to getting the size of the root with a string, I think that method inaccurate. I would not attempt to get it that way. The method which I always use in getting the size is to carefully trim my root in the way all the rest of you do, and then take a piece of German silver or copper,—anything that is thin,—make a band of that, fit it over the root, leaving it a little large. I carry the band to place, pass a ligature twice around the same, and, holding the two ends firmly in one hand, burnish the band carefully to place. Tie the ligature, remove the band, and cut open where it laps. In that way I get a very exact pattern, both in size and shape, by which to cut my gold, which is made no larger, and perhaps a trifle smaller, than the pattern. I never lap my bands, always butt and solder them. Of course, if the band is a little loose, I cut and solder it again.

Speaking of irritation of the gum, I have seen many cases of crowns put on with gold bands, perhaps twenty-eight gauge, and not bevelled at all, but the full thickness of the band was driven up under the gum, and it is not surprising to me to find such bands causing irritation.

*Dr. Andrews.*—There is one important thing it would be well to speak about, and that is the cutting away of a considerable surface of a live tooth. It is well known that when dentine is reached, the exposed part of the dentine is irritated, and this irritation sooner or later may result in a pathological condition. There is a question whether it would not be best to kill the pulp at once. I have heard recently of the supporting teeth of a bridge loosening and coming out on account of this change. Is it safe to trim away a great deal of a live tooth to put a cap on?

*Dr. Wilson.*—In reply to Dr. Andrews, I would say that the grinding of the teeth has not in my case been followed by any disagreeable consequences. When I take the bridge off and brush the natural teeth with cold water, I notice a little difference in temperature.

WILLIAM H. POTTER, D.M.D.,  
*Editor American Academy of Dental Science.*

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## Editorial.

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### A HALF-CENTURY OF ANÆSTHESIA.

So accustomed have we become to the thought of relief from pain in surgical operations, that very few of the present generation can realize that the immunity from suffering has been introduced within the memory of many now active upon the world's stage. The present century, nearing its close, will go down into history as the period of the greatest achievements, not only in science, mechanics, education, and art, but in the amelioration of human suffering. Through anæsthesia and the discoveries in bacteriology the range of surgical operations has been extended beyond the wildest dreams of the operators of the first half of the present century.

The mind as it contemplates the tortures of the past can but regard the introduction of anæsthesia as one of the greatest blessings ever given to the human family, yet it is surmised that the world moves on its way unconscious of the debt due to those who presented this boon to humanity.

Anæsthesia cannot be classed with the inventions of this prolific age, but rather with its inspirations. The heedless observer would say it was a happy thought when Wells, in 1844, decided to have a tooth removed with nitrous oxide, but an idea of that character would not have entered his active brain except there had been an earnest seeking for an effective means to accomplish the result of extraction without pain. The soil must be prepared both in the mental and physical life before germination can take place, whether that be in a thought or a seed. Hence, judging from this well-known law of development, Dr. Wells was prepared to accept a suggestion looking towards this end when, on December 11, 1844,

he sat in the chair to test upon his own person the possibility of removing a tooth without suffering, as severe a test to which probably he could have subjected himself.

The importance of having some means to alleviate pain had not been appreciated by the medical faculty from the beginning of the practice of the healing art, and no systematic measures had been taken to demonstrate the possibility of its accomplishment. So thoroughly was this body imbued with the idea that suffering was a part of the inheritance of the race, that not only was no attempt made to change this condition, but apparently it was not desired. The evidence of this was manifested by the coldness and evident want of interest with which the subject and the original workers were received.

It was, therefore, not surprising that Wells not only met with opposition from the medical faculty, but experienced the fate of all original thinkers of having a host of antagonizing critics, as well as imitators and claimants for the honor of discovery, when it became an honor. That he finally succumbed under the strain is not surprising.

This is not the place to enter into the merits of the controversy in regard to the question as to the discovery of anæsthesia, which has continued until the present time, but a candid and judicial examination of all claims to priority have failed, in the opinion of the writer, to disturb the settled conviction of the dental profession that the Paris Medical Society was justified, in January, 1848, in proclaiming to the world that to Dr. Horace Wells was "due all the honor of having first discovered and successfully applied the use of vapors or gases whereby surgical operations could be performed without pain." The exhaustive "Inquiry into the Origin of Modern Anæsthesia," by Hon. Truman Smith, published in 1867, should be sufficient, we think, to establish this point beyond controversy in all candid minds.

It is natural, perhaps, that medicine has found it a disagreeable memory that this most important aid in the relief of human suffering *should have been the work of a dentist*, and that earnest efforts should have been made to place the honor upon a medical graduate. That this has failed needs only passing reference, and it still remains to the honor of dentistry that it presented to the world this great boon.

Fifty years have passed since that memorable period, and we have now entered upon the year 1894 and can calmly view the work of the past, and, setting aside the acrimonious feelings engen-

dered in 1844, can feel that the time has arrived when we, as a profession, can publicly claim the honor and glorify the event.

In view of these facts the Odontological Society of Pennsylvania proposes, before the close of the present year, to appropriately celebrate this discovery, and it seems to us this very proper initial movement should be regarded as an excellent example to be followed by the dental profession throughout the world. It is not merely essential to demand for dentistry the honor of this work, for that is a minor matter, but it is important as showing to an incredulous world the value of the labor of this body and also the power which concentrated effort possesses when applied to the diminution of human ills in any direction, and that dentistry has demonstrated in its work that it has occupied no minor place in this labor.

A concurrent demonstration of all the dental organizations would certainly be impressive. It would show beyond criticism that professions are not ungrateful, but that they are capable of holding in undying memory their greatest benefactors, and among these Dr. Horace Wells, late of Hartford, Conn., holds the most illustrious place.

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#### PROFESSOR W. H. EAMES.

On another page will be found the announcement of the death of this prominent worker in the profession, accompanied by a sketch of his life.

The blow has fallen with a shock to his friends in the East, and it is difficult to realize that we will never again meet with him in the work in which he was ever an earnest and most efficient laborer.

It has been our pleasure to meet with him yearly in our several annual conventions, and especially in connection with the National Association of Dental Faculties. In this body he exercised a powerful influence. His clear logical mind made him a valuable collaborer in the work, always ready to unravel the intricacies of difficult questions and place them in a light to be readily understood. He was honored in this organization by being made its presiding officer.

While a resident in the West, and energetic there in associations, editorial work, and college labor, his activity passed beyond sectional limits and grasped the needs of the entire profession. He was broad in his intellectual force, genial in companionship,

and thoroughly in harmony with the progressive demands of the hour.

Death has gathered a rich harvest in the past few years, but while the silent reaper has taken many from our ranks whose places have never been filled, few of these will be more sincerely mourned by his co-workers than this faithful exponent of the best life of his profession.

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## Obituary.

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### WILLIAM HENRY EAMES, D.D.S.

DR. WILLIAM HENRY EAMES died in St. Louis, at the residence of his daughter, Dr. Emma Eames Chase, on March 29, after a short illness.

He was born in Auburn, N. Y., August 23, 1828. His father, Georges Eames, soon after the birth of this son, removed to Oneida County, N. Y., where his father, James Eames, with his large family had settled in 1794. They were progressive people, taking an active part in all public affairs, and particularly interested in educational advancement. The active interest, untiring zeal, and devotion with which Dr. Eames labored for the advancement of his profession, in the college, in the journals, and in societies, was a direct continuation of the spirit with which his father and grandfather before him had worked for the intellectual advancement of the rising generation. He was educated in the public schools, and at the Clinton Academy, in Oneida County. After teaching school several years he commenced the study of medicine with Dr. Porter, an eminent English physician, and went to Ann Arbor to complete his medical studies at the Michigan University. While there he decided to study dentistry, and entered the Ohio Dental College, graduating in 1853. He returned to Ann Arbor and formed a partnership with his preceptor, Dr. Porter. He was married in 1855 to Laura M. Scofield, of Clinton, Mich., and removed to Lebanon, Tenn., in 1857, remaining there until 1862, when, owing to the disturbed condition of the South, he removed to St. Louis, Mo. He at once became a member of the St. Louis Dental Society, and always took an active and prominent part in the profession in St. Louis. It was at a meeting of the Society at his residence that the subject



of organizing a dental college in St. Louis was introduced. There were present at this meeting Drs. Judd, McKellops, Forbes, Peebles, and others, and from its first inception he was an active worker, continuing through many years to the very night before he was stricken down. He was one of the founders of the *Missouri Dental Journal*, and for many years its editor, and later, editor of the *Archives of Dentistry*, which succeeded it. Dr. Eames was an active member of the American Dental Association, the Missouri State Dental Association, and the St. Louis Dental Society; the last two of which he has been president of at different times. He had also served as president of the Association of Dental College Faculties, and was an honorary member of the Illinois, Iowa, and other State and district dental societies. It is not necessary to speak here of the genial nature and the many admirable qualities of our departed brether; these are known to all who ever had the pleasure of his acquaintance, and will be referred to as pleasant recollections until all have followed him to the other side.

The doctor leaves a wife and seven grown children,—two sons and five daughters.

A. H. FULLER.

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## RESOLUTIONS OF RESPECT TO DR. EAMES.

At the regular meeting of the Chicago Dental Society, April 3, 1894, the following resolutions were passed:

WHEREAS, It has come to the knowledge of the members of the Chicago Dental Society that the dental profession is called to mourn the loss of one of its most distinguished and honored members. Therefore, be it

*Resolved*, That in the decease of Professor W. H. Eames the world has lost one of its foremost educators, his family a devoted husband and father, and the profession a sincere, earnest, and useful devotee. It is fitting that the Society should pay its tribute of respect to one who has so long and honorably filled the position, before the world, and we mourn his death as a personal loss to each and all of us. Be it further

*Resolved*, That a copy of these lines be transmitted to the family of the deceased, and a further copy be sent to the journals for publication.

A. W. HARLAN.  
TRUMAN W. BROPHY.  
EDGAR D. SWAIN.

## Domestic Correspondence.

### ANTIDOTE FOR ARSENIC. CORRECTION OF FORMULA.

PHILADELPHIA, March 17, 1894.

TO THE EDITOR :

SIR,—At page 207 of the March issue of your valuable journal appears a clipping from the *New York Medical Times* of June, 1893, entitled "The Antidote for Arsenic." The prescription as given contains an error which may cause damage to life if allowed to pass uncorrected, and is as follows: "Take of tinctura ferri chloridi, four ounces; aqua fortis, four ounces; mix in a vessel of twelve ounces capacity, and add aqua ammoniæ, one drachm," etc. The object of the mixture is to produce the hydrated oxide of iron in the moist state, which is the recognized chemical antidote for arsenical poisoning. It will be readily seen, however, that the addition of an equal amount of aqua fortis to the tinctura ferri chloridi would not of itself produce a precipitate of ferric oxide, and would also effectually prevent its precipitation by the one drachm of ammonia to be subsequently added. The resulting mixture made according to the formula given would consist of approximately equal parts of tinctura ferri chloridi and strong nitric acid with some ammonia nitrate. Inasmuch as the directions are, "after pouring the mixture on a large wet muslin drainer, to wring out the water and alcohol, wash with fresh water, etc., give four fluidounces at once, and after an emetic to give two fluidounces every ten minutes," it would seem highly probable that one not familiar with the chemistry or pharmacology of the subject might presume that the filtrate was intended to be taken, especially as no precipitate would be formed under the circumstances; in fact, no reference to the formation of a precipitate is made in the article.

The direction to add aqua fortis is no doubt an accidental error, due to careless proof-reading of the original article in the *New York Medical Times*, in which journal, page 94 of the June issue of last year, it is printed "aqua fort.," and is almost certainly intended for aqua font., or ordinary hydrant water. Dr. Squibb states that he was not the author of the communication, and the *New York Medical Times* people are silent upon it after specific inquiry as to their source of information. Squibb's antidote for arsenical poisoning consists of a diluted solution of tersulphate of iron and a mixture

of magnesia and water (1 to 10) dispensed in separate packages which, when mixed together, make the official ferri oxidum hydratum cum magnesia ready for use. I have taken the liberty of calling attention to this error, which is a serious one in that the prescription as published is not in any respect an antidote for arsenic, but if swallowed in the amounts directed would be certainly and rapidly fatal.

Yours truly,

EDWARD C. KIRK.

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### CASE IN PRACTICE.

CAMERON, Mo., March 15, 1894.

TO THE EDITOR:

SIR,—I would like to state a case, and ask a question through the INTERNATIONAL DENTAL JOURNAL.

CASE.—A young lady of twenty-two, has both of her upper lateral incisors turned wrong side out. They are perfectly formed; instead of being crowded, her front teeth all have liberal spaces between; gums perfectly solid and healthy.

Question.—Can these teeth be extracted and turned right side out with perfect safety? If so, should the pulp be removed or not?

As a matter of general information, I solicit replies either through the JOURNAL or personally.

Respectfully,

E. W. STEVENS.

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## Notes and Comments.<sup>1</sup>

THE CAUSE OF HYPNOSIS.—We have had numerous essays and discussions in the societies, the journals, and the press upon the subject of hypnotism, but the point of most interest and concern to many of us has not been reached,—that is, a satisfactory explanation of these phenomena. In this respect very little advance has

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<sup>1</sup> The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 212 South Fifteenth Street, Philadelphia.

been made for the last quarter of a century or more. When we come to seek the source, the cause commensurate to the effect, it has evidently baffled the investigator and seemed as inexplicable as the fundamental problem of human existence, "What is life?"

At a recent meeting of the Odontological Society of Pennsylvania the psychic side of hypnosis was touched upon by several, and when the evidence is all in I am confident the verdict will be, that this recognized force in man (call it the unknowable) has much to do with all these manifestations.

It was only a few years ago that many of our scientific men, especially our physiologists, seemed moving towards a material explanation of all things. They tell us that the phenomena of perception is caused by a movement in the cells of the optic thalami, while that of the memory is caused by a movement in the cells of the cortical portion of the cerebrum. These cells, which are intimately associated, respond to special excitement and give rise to the phenomena known as recollection and association of ideas.

This can be demonstrated; but can such physiologists explain the force back of cell-life? Can the chemist's retort or the biologist's culture-tube solve the secrets of animal creation? No; but, on the other hand, we could marshal an imposing array of witnesses who express the conviction that "we are now nearly everywhere compelled to assume a specific yet unknown activity of the living cell." With this frame of mind—as a recent issue of the *Philadelphia Press* has it—comes an increasing conviction that no material explanation of the universe is adequate or logical, a growing belief that a power must be accepted as enwrapping, supporting, and rendering vital the universe of matter and the world of mind.

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## Current News.

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### MIDWINTER FAIR DENTAL CONGRESS.

THE Midwinter Fair Dental Congress will be held at San Francisco, Cal., June next, from the 11th to the 15th inclusive.

All reputable legal dentists of the nine States and Territories of the Pacific slope, together with those east of the Rockies who wish to join us, are expected and urgently requested to attend this meet-

ing, bringing with them anything and everything that may be of interest to the profession. Come prepared to give rather than to take.

Interesting papers and clinics are promised from leading men both East and West.

A meeting is anticipated that will be second only to that held at Chicago last August.

The work is being carried forward by the following officers and chairmen of committees:

President, Luther A Teague, 10 Geary Street, S. F.; Vice-Presidents, S. E. Knowles, 139 Post Street, S. F.; J. A. W. Lundborg, 219 Geary Street, S. F.; Treasurer, W. A. Knowles, 118 Grant Avenue, S. F.; Secretary, W. Z. King, 1001 Valencia Street, S. F.; Assistant Secretary, C. W. Hibbard, 202 Stockton Street, S. F.; Corresponding Secretary, C. E. Post, 14 Grant Avenue, S. F.

*Chairmen of Committees.*—Executive, S. H. Roberts, 120 McAllister Street; Finance, Harry P. Carlton, Crocker Building; Programme, Walter F. Lewis, 462<sup>3</sup> Thirteenth Street, Oakland; Editorial, J. D. Hodgen, 1005 Sutter Street; Membership, T. N. Iglehart, 713 Sutter Street; Invitation, L. L. Dunbar, 500 Sutter Street; Reception, J. A. W. Lundborg, 219 Geary Street; Local Arrangement, F. C. Pague, 819 Market Street; Dental Club, W. J. Younger, 300 Stockton Street; Advisory, Thomas Morfrew, 702 Market Street; Association Day, A. F. Merriman, Jr., 1003<sup>3</sup> Broadway, Oakland; Publication, F. Teague, 21 Powell Street; Transportation, R. H. Cool, 1115 Broadway, Oakland.

CHARLES E. POST, D.D.S.,  
*Corresponding Secretary.*

## JOINT MEETING OF THE IOWA AND NEBRASKA STATE DENTAL SOCIETIES.

THE annual meeting of the Iowa and Nebraska State Dental Societies will be a joint meeting, held May 1 to 4, inclusive, at Council Bluffs, Iowa, and Omaha, Neb. An interesting programme will be presented. All are cordially invited to attend.

W. C. DAVIS, Lincoln, Neb.,

*Secretary Nebraska Society.*

F. T. BREENE, Iowa City, Iowa,

*Secretary Iowa Society.*

## CHANGE IN THE DATE OF THE NEW JERSEY JULY EXAMINATIONS.

THE New Jersey Dental Commission will hold its summer examinations at No. 88 Broad Street, Elizabeth, N. J., commencing on the second Tuesday in July, instead of the third Tuesday, as heretofore.

Applications should be in the hands of the Secretary by June 26.

G. CARLETON BROWN,  
*Secretary.*

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## RECENT PATENTS.

A LIST of recent patents reported specially for the INTERNATIONAL DENTAL JOURNAL:

512,065.—Box for Tooth-Powder. Warren A. Spalding, New Haven, Conn. Filed July 24, 1893.

512,840.—Dental Mould for Teeth. James R. Phelps, Marysville, Cal. Filed June 20, 1893.

512,841.—Artificial Tooth-Crown. James R. Phelps, Marysville, Cal. Filed August 17, 1893.

512,856.—Artificial Tooth-Crown. Coldwell C. Beebe, Racine, Wis. Filed November 7, 1892.

513,015.—Dental Forceps. Woodbury S. How, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed November 13, 1893.

513,016.—Teeth-Separator. Woodbury S. How, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed November 13, 1893.

513,178.—Adjustable Angle Attachment for Dental Handpieces. Charles L. Furman and George E. Holland, Peoria, Ill. Filed September 8, 1890.

513,214.—Adjustable Dental-Engine Bracket-Arm. Jere E. Stanton, Boston, Mass. Filed June 19, 1893.

513,328.—Rubber-Dam Clamp. James W. Ivory, Philadelphia, Pa. Filed February 13, 1893.

513,362. Dental Plugger. George A. Foster and Charles E. Hoffman, New Albany, Ind. Filed April 10, 1893.

513,818.—Artificial Tooth. Eli H. Neiman, York, and Samuel E. Beecher, Milton, Pa.; said Beecher assignor to said Neiman. Filed December 29, 1892.

Trade-Marks.—24,149.—Tooth Paste or Dentifrice. William J. Hurd, St. Paul, Minn. Filed November 14, 1893. Essential feature, the words "King Bee" and the representation of a bee's body with a portrait of the registrant for a head to the same.

Patents which expired January 2, 1894. Granted January 2, 1877:

Reissue.—7452.—Dental Drills. G. V. Black, Jacksonville, Ill., assignor, by mesne assignments, to S. S. White, Philadelphia, Pa. Patent No. 117,732, dated August 8, 1871. Filed November 22, 1876.

Patents which expired January 16, 1894. Granted January 16, 1877:

186,234.—Electro-Magnetic Dental Pluggers. J. E. Dexter, New York, N. Y. Filed October 23, 1876.

186,287.—Tooth-Brushes. S. Woolverton, Trenton, N. J. Filed August 15, 1876.

186,307.—Cotton-Holders for Dental Use. T. Cogswell, Boston, Mass., assignor to Codman & Shurtleff, same place. Filed August 26, 1876.

Patents which expired January 23, 1894. Granted January 23, 1877:

186,471.—Tool-Carriers for Dental Engines. J. W. Gilbert, Philadelphia, Pa., assignor to S. S. White, same place. Filed December 11, 1875.

186,504.—Angle Attachments for Dental Engines. E. T. Starr, Philadelphia, Pa., assignor to S. S. White, same place. Filed December 5, 1876.

186,522.—Stamping Dental Plates. C. F. Barnard, Victoria, British Columbia. Filed August 8, 1876.

186,580.—Dental Pluggers. C. King, Pittsburg, Pa. Filed July 24, 1876.

Patents which expired January 30, 1894. Granted January 30, 1877:

186,680.—Dental Pluggers. C. King, Pittsburg, Pa. Filed August 21, 1876.

186,782. Barbers' and Dentists' Chairs. L. M. Angle, Chicago, Ill. Filed November 21, 1876.

186,793.—Cases for Dental Instruments. E. P. Brown, Flushing, N. Y. Filed April 3, 1876.

186,870. Chairs. F. L. Patch, Florence, Mass. Filed July 10, 1876.

186,914.—Machine for Folding Gold-Foil for Dental Purposes. R. S. Williams, New York, N. Y. Filed December 28, 1876.

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### ANNUAL MEETING OF THE WOMAN'S DENTAL ASSOCIATION.

THE Second Annual Meeting of the Woman's Dental Association of the United States was held at the office of Dr. Mary H. Stillwell, 1300 Arch Street, Philadelphia, Pa., Saturday evening, March 3, 1894.

The following officers were elected for the ensuing year: President, Dr. Anna T. Focht; Vice-President, Dr. Elizabeth A. Davis; Recording Secretary, Dr. Emily W. Wyeth; Corresponding Secretary, Dr. Eliza Yerkes; Treasurer, Dr. Matilda Groth.

*Executive Committee.*—Drs. Mary H. Stillwell, Edith L. Brown, Hannah M. Miller, Martha C. Corkhill, and Maria Lasser.

The Vice-Presidents from representative States were re-elected, except that, in New York, Dr. Alice Ireland takes the place of Dr. Olga Neyman Glücksman.

Dr. Cora J. Little, of Nebraska, Dr. Sara May Townsend, of Colorado, and Dr. Mary Weston, of Missouri, were added to the list. The membership—thirty-two at the close of the first year—now numbers forty-three.

EMILY W. WYETH,  
*Recording Secretary.*

8920 FAIRMOUNT AVENUE, PHILADELPHIA, PA.



# THE International Dental Journal.

VOL. XV.

JUNE, 1894.

No. 6.

## Original Communications.<sup>1</sup>

### A CASE OF DRAWING THE LOWER JAW FORWARD.<sup>2</sup>

BY H. E. CUTTER, D.D.S., CAMBRIDGE, MASS.

MR. PRESIDENT AND GENTLEMEN,—It was with some hesitancy that I accepted your invitation to prepare the paper which I bring before you. The subject is "A Case of drawing the Lower Jaw Forward."

The patient was a girl eleven years of age. The upper arch was narrow and pointed, with the front teeth very prominent. The lower arch was regular, but the front teeth were elongated in comparison with the bicusps, so that their cutting-edges almost touched the gum behind the upper incisors. The upper centrals projected fully a quarter of an inch beyond the lower teeth, as shown in Model 1. The upper and lower cuspids, however, almost touched each other. When the mouth was at rest, the lips did not cover the front teeth, so that the face had an unpleasant expression. The profile was even more uncomely, for, besides the projecting teeth, the chin was receding, and seriously marred what would otherwise have been a fine face.

I think that it is important to make a careful study of the

<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

<sup>2</sup> Read before the American Academy of Dental Science, February 7, 1894.

general outline of a patient's face, as well as of the teeth, before beginning any corrective treatment. And we should take into consideration the teeth and facial expression of the parents of the patient, in order that we may know what is likely to be the natural development in the child. I think that, if this were more frequently done, we should have more satisfactory results. By recognizing a family tendency to a deformity at an early age, a simple method can often be successfully employed to prevent its development. Another patient might have a set of teeth very similar to the one before us, and yet an entirely different treatment be required. In the one case the deformity might be due to a receding lower jaw, but in the other to a projecting upper jaw. The first and most important question in cases of this kind is to decide at the outset whether it is the upper or the lower jaw which requires treatment, for upon this, success or failure largely depends.

Before undertaking a case of this character, one should first satisfy himself that the patient is one who will willingly undergo some unpleasant requirements. For there is occasionally a person who is very anxious to undergo treatment, and for a time he faithfully follows the instructions given; but gradually he becomes indifferent and careless, and the treatment of the patient has to be abandoned.

In the case before us it was evident that the lower jaw could not be carried forward without first expanding the upper arch. This was done by means of a thin rubber plate, into which was vulcanized a German silver jack-screw. To hold the width which was thus gained, and at the same time to flatten the arch, another plate was made. A spring German silver wire was bent around close to the outside of the teeth, with its ends embedded in the plate at the sides. From time to time the wire was bent so as to bear hard on the mesial edges of the centrals, and thus the arch was gradually flattened. The result is seen in Model 2.

This being done, the next step was a more difficult one, which was to lengthen the bite and at the same time draw the lower jaw forward. The plate that I next made was like the one which Dr. Hamilton used in a case which he once described before this society. This plate was made thick over the bicusps and first molars and behind the front teeth. Deep depressions were made in the plate a little forward of the places where the cusps of the lower teeth would naturally touch the plate. The result was that the patient began to carry the lower jaw forward a little, so that the teeth would enter these depressions.

MODEL 1.



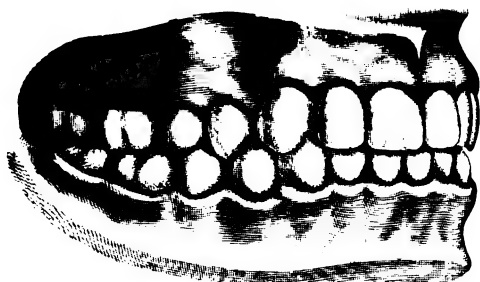
MODEL 2.



MODEL 3.



MODEL 4.





I found, however, that a plate which covered the bicuspid and first molars prevented these teeth, both in the upper and lower jaws, from elongating and forming a new articulation to correspond with the lengthened bite. Therefore I made another plate for the upper arch. This one was thickened only behind the front teeth, where depressions were made to receive the points of the lower incisors. No other teeth of the lower jaw were allowed to touch any part of the plate. This plate was held firmly in place by wire clasps encircling the sixth-year molars. There was also attached to this plate a wire which passed around the outside of the front teeth to keep them in the flattened position which they had assumed.

In making this plate much care was required to have the depressions in just the right places and of exactly the proper depth. A wax and paraffine base-plate was fitted to the plaster model of the upper arch. To the part where the plate was to be thickened soft yellow wax was then added. While the wax was soft the base-plate was inserted in the mouth, and the patient told to throw the lower jaw forward and bite into the wax. I thus determined how much the jaw was then to be carried forward and the bite lengthened. This was an important question, for a slight variation at this point might have produced an unfortunate result. I made several plates of this character, as the amount to be gained had to be gradually accomplished. Model 3 was made while this work was being done.

When I took the case, but one twelfth-year molar had begun to appear; when the work was completed, all four of these molars had erupted and interlocked with each other. The result was that the patient could comfortably bring her jaws together only as they had been newly related.

All that then remained was for the bicuspid and sixth-year molars to complete their articulation, which they are now doing, as is shown in Model 4.

It was necessary to carry the lower jaw forward while the twelfth-year molars were erupting, as the retaining of the jaw in the new position depended entirely on the articulating of these teeth. Unless the operation had been undertaken at just this time, it is doubtful if it could have been accomplished. I think that it would not have been possible to secure the retaining of the jaws in the relation they now are had the attempt been made at an earlier or a later time.

SOFT FOILS AND PLASTIC STOPPINGS.<sup>1</sup>

BY DR. C. E. FRANCIS, NEW YORK.

MANY years ago, long before dentistry had reached its present advanced status, two substances only were in general use for stopping cavities in teeth,—viz., soft gold- and tin-foils. The process of annealing the former, with a view of developing its property of cohesion, as was first demonstrated to our profession by the late Professor Arthur, was at that time unknown. Fillings of either of these materials were introduced on a like principle, and both kinds of foil were similarly prepared for the purpose. The most common method of preparation was to cut the foil into strips, from three to six to the sheet, and roll or twist into ropes or coils, or fold into ribbons. One end of the coil (usually half- or full-length of the sheet) was carried with the foil-carriers or "tweezers" to the mouth of the cavity, and pressed in. With a good-sized "plugger," attached to a strong ivory handle, the foil was worked to the distal part of the cavity, or to a point where the best anchorage could be obtained, and forced "home." The entire strip or coil, thus worked and securely packed, was followed by another coil, and so continued until every portion of the cavity was loaded, and the cavity walls made as secure as possible to prevent leakage.

Although the foils then in use possessed to a certain degree properties of cohesion, little or no dependence was placed on a perfect union of the different layers as they were packed against each other. Sharp, smooth, flattened points, of various angles, massed the folds together, and wedge-shaped indentations were made on the surface of the filling in the direction of the cavity walls, which in turn were also filled, and this continued until the filling became so thoroughly impacted as to resist further effort to puncture its surface or to add to it more filling-material. Occasionally the foils were formed into loose pellets of various sizes, especially for larger fillings, and used in connection with the folds or ropes; and in some instances the strips of foil were made into cylinders by rolling them around smooth broaches. The cylinders were carried to the tooth with one end of each resting upon the floor of the cavity and the other ends projecting from the entrance. These were also crowded together against the cavity walls and against each other, until the cavity was full and no more could be added. The pro-

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<sup>1</sup> Read before the New York Odontological Society, March 20, 1894.

jecting ends of the cylinders were then forced against the cavity-margins and towards the centre until a hard smooth surface was obtained.

Although the rubber dam, now in such common use and so wonderfully efficacious in insuring absolute protection from oral secretions, was then unheard of, many of our old-time dentists succeeded in introducing fillings that did most efficient service, suggesting a degree of skill and patience on the part of their builders worthy our ardent admiration.

It was my good fortune, when a student, many years ago, to examine quite a number of soft gold-foil fillings in the mouth of a Boston gentleman, which a few years previously had been inserted by that grand old New England dentist Dr. Joshua Tucker. They were large, and some of them contour fillings, with smooth, brilliant surfaces. They were decidedly beautiful, and to my young eyes a feast so rich as to incite my earnest efforts, with a hope for similar achievements. Many other operators of that period were equally successful, despite their old-fashioned instruments and limited conveniences.

Before plastic stoppings were in vogue, tin-foil was used in many instances as a substitute for gold, especially in large cavities; probably with a view to economy; but it fulfilled its mission in a most reliable manner. A large contour filling in a devitalized superior bicuspid, introduced by the late Dr. Riggs, of Hartford, over forty-five years ago, stood securely for two decades, a monument of dental skill, and even after the surrounding walls of enamel had, from severe service, broken away, the solid lump of tin did effective duty as a masticator, boldly meeting its occluding neighbor in its work.

Dr. Lord, of this city, at a meeting of this Society several years ago, instanced a case where a tin-foil filling, in the mouth of a lady, which was inserted sixty years before, was yet in good condition. Some time ago I received a call from one of my early patients, who exhibited a very large tin-foil filling in a superior molar which I inserted twenty-five years before, and which was still in an excellent state of preservation.

Before the era of amalgam as a tooth-stopping, tin-foil was extensively employed, but since the advent of plastic stoppings it has been crowded nearly out of use.

Amalgam was introduced in this country by the famous Crawford brothers in the year 1833, and a new departure in the way of tooth-fillings was thus established. The material was so soft and

pliable, and could be manipulated with so little effort on the part of the operator, and inserted with such comparative ease to the patient, that it became a most inviting and exceedingly popular filling with many dentists then in practice, and at the present time is even more extensively employed. Always, however, there have been certain objections to this substance of sufficient weight to restrict its use with many operators, and although some of the objections are based on prejudice, or are purely imaginary, others are so well founded as to cause hesitation on the part of many cautious ones who at times greatly feel the need of some such filling-material. Efforts are continually in progress to overcome these objections and to perfect this filling, but whether or not they prove successful, it is evident that amalgam has "come to stay," and not likely to be entirely dispensed with. In many cases it has certainly proved of great value, and there are certain conditions where no other material will answer so good a purpose.

Gutta-percha stopping appeared before the public in 1848, and met with decided favor, especially among those who decried amalgam. It was first produced by the late Dr. Asa Hill, of Norwalk, Conn., and, after subsequent improvement in its manufacture, became much used, and proved an excellent stopping for buccal surfaces of posterior molars and other cavities not much exposed to attrition. The best gutta-percha stopping ever placed in market was manufactured by a Mr. Bevin, of Boston, a practical experimenter and worker in rubber goods at the factory of the Goodyear Company. Unfortunately for our profession, and I may also add for the community at large, Mr. Bevin died without ever having disclosed the secret of his formula; and although good preparations of gutta-percha have since been produced, none have ever quite equalled for toughness and durability the famous "Bevin's stopping."

Gutta-percha stopping, if well prepared and carefully introduced, will preserve the cavity walls of a tooth a number of years, and even though the surface wears away, the remainder still clings to the walls with a wonderful tenacity. These stoppings, however, expand more or less in the mouth, and are liable to burst asunder frail cavity walls; and in deep cavities, where pulps are nearly exposed, this same expansion of the filling crowds forcibly against the thin layer of dentine covering the pulp, causing irritation and perhaps congestion to this delicate organ. But gutta-percha has its place, and is valuable in many cases, especially so as a temporary stopping for children's teeth.



Next in order of filling-materials ushered into existence were the fillings of oxide of zinc, the oxychloride antedating the oxyphosphate some fifteen or more years. Each have their special value, but the former is not much used at present. The latter, however, is extensively employed, although serving only a temporary purpose. The oxide of zinc fillings waste away readily, and require frequent renewals. They cannot be counted on as reliable for long service, especially as patients are likely to neglect having them renewed. The oxyphosphate may be used to good advantage in filling the teeth of children; also as a floor or covering to a thin layer of dentine over a nearly exposed pulp.

In the course of the dentist's practice he occasionally finds tolerably large cavities with frail chalky walls, bearing evidence of rapid decalcification. These cavities, or some of them, may have been previously treated to fillings of gold, and very likely introduced as carefully as circumstances would permit; yet, so far as the preservation of the teeth was concerned, the fillings proved decided failures. Other cavities of this character may have once been filled with oxyphosphate of zinc, but in the course of time this material had succumbed to the agents of dissolution, leaving cervical borders undermined and unprotected. Perhaps gutta-percha had for a time kept some of these cavities securely, but finally yielded to the forces of attrition, and but a fragment remained. And when amalgam had been tried, jagged and discolored margins revealed the story of leaky fillings and the mischievous intrusion of decalcifying fluids, which perhaps destroyed the vitality of the organs or nearly ruined the integrity of their structure.

In viewing such results, the question naturally comes to us, What can be done to save such delicate teeth and prevent them from going to utter destruction?

Fifty or more years ago, there would have been little hesitation by dentists of that period in coming to a decision. If the teeth were considered worth filling at all, tin-foil would undoubtedly have been chosen as the most reliable material for the purpose. And if tin-foil answered so good a purpose in primitive times, and with primitive instruments and inadequate means for protection against moisture, why may it not at the present time, under far more favorable conditions for impaction, answer as well, or even better than in former times? The peculiarity that tin possesses is its ready adaptation to the walls against which it is packed, and this is an exceedingly important point to consider. It shows less rigidity in

process of manipulation than gold, consequently requires less force to condense it. It can be pressed compactly against the cervical margins, and worked securely against delicate cavity-walls with little fear of crushing their borders. It does not "bulge," nor show evidences of expansion or contraction,—faults frequently attributed to amalgam. It does not wash out, as do stoppings of oxide of zinc, nor does it swell or wear away like gutta-percha.

The fact that many gold fillings in proximal cavities have failed to preserve their cervical edges has induced a number of dentists to adopt the plan of packing such borders with tin and completing the fillings with gold. It is claimed by those who have been in the habit of combining these two metals that greater safety is thus secured, or that the fillings are less likely to become undermined at these particularly vulnerable points,—the cervical borders. This seems a very rational conclusion, and possibly a combination of tin and gold, used in this manner, will insure the safety of such cavities in bicuspsids and molars better than if filled entirely with gold. Yet objections have been made to such a combination. Fillings of this sort in time become much discolored, and to a certain extent the tin exhibits a tendency to oxidize,—much more so than where tin is used alone. This is probably due to a galvanic action of the two metals thus packed together. But leaving out the gold, the tin may be so firmly forced into a cavity as to present a pretty dense surface, as has been repeatedly demonstrated by many of the old-time operators. It was not for lack of density that the use of tin-foil was abandoned by those who formerly employed it, or that its use became so limited; neither for fear of oxidization, nor for lack of confidence in its preservative properties. It was given up simply because other materials came into use that were more easily and quickly manipulated; and viewing the matter also from a financial stand-point, tin-foil fillings were discarded because they were considered the least profitable of all others.

In former times, tin was viewed by all parties as a cheap filling-material, and individuals who had their teeth filled with it seemed to take it as a matter of course that the cost of such fillings would be very much less than if gold had been used. They did not take into account the time employed in preparing cavities or introducing the stopping, but rather based their ideas on the relative value of the two metals. Dentists, on the other hand, finding that it required the same length of time to prepare cavities for tin as for gold, and nearly as much time to introduce it, consequently reasoned that it would be more pleasing to their patients and more profitable to

themselves to make use of the "precious metal." Then, too, "gold" has a *royal* sound, and sometimes there is much in a name.

But, gentlemen, we seem to have turned a leaf and reached another era in the history of tin stopping. A new form of this metal has recently been introduced that possesses a property which bids fair to rival all other materials in special cases. I refer to tin shavings, as recently exhibited at the Brooklyn meeting by Professor Darby, of Philadelphia, specimens of which were presented to the members of this Society at the January meeting by Dr. Perry. These shavings are produced by fixing a block of refined tin in a turning-lathe, from which may be pared, with a suitable chisel, long, thin, narrow strips. These strips or shavings form a most admirable filling-material. They can be packed and condensed with comparatively little effort, have a decided cohesive property, and the metal is so pliable that it can be worked snugly against the walls of cavities. In every respect, so far as has been tested, it seems preferable to the tin-foil of former periods. Although quite cohesive, it offers little resistance to the force of the filling instrument. It can be worked by hand-pressure or under the influence of the mallet, and when finished presents a beautiful surface.

Within a few weeks, or since the last meeting of this Society, a still greater improvement has been made in the manufacture of tin filling, in the form of cohesive tin-foil. The discovery made, or idea suggested, by Professor Darby, and so ably demonstrated by him, that tin in a state of absolute purity possessed a most decided cohesive property, induced one of our oldest and best-known manufacturers of gold-foil (Mr. Kearsing) to experiment with the metal with a view of producing a foil possessing this much-desired property of cohesion. The object sought has been attained, and we have now at our command a filling-material which, if discreetly used, has no superior for preserving cavity-walls, or protecting them from further action of decalcifying agents. This new foil, although cohesive, possesses no rigidity, as is the case with cohesive gold foil, but can readily be carried to every part of a cavity with no show of resistance. It is far more easily conveyed to the cavity than the shavings produced by Professor Darby, and can be consolidated with hand-pressure instruments or any sort of mallet; yet where the mallet is used, the blows should be decided, but not too rapid. The same form of instruments may be employed as for gold fillings, yet possibly the serrations of some of the condensing-points might be a trifle sharper.

The fillings can be built or extended to any desired contour, and when well condensed their surfaces are sufficiently hard to receive a smooth and brilliant polish, much like fillings of gold. They may be finished with keen-edged sickles, corundum wheels, and paper disks, and polished with buffs and burnishers.

In using tin it is not well or wise to lay too much stress upon the fact that it is an inexpensive metal and only fit for a cheap filling. If the mind of the operator is possessed with this idea, he may lack the required inspiration for effective results. The same degree of care should be exercised in preparing cavities, trimming their margins, sterilizing with antiseptics, and thoroughly drying with bibulous paper and warm air, as if gold were to be used. Also the same precautions observed for preventing moisture from coming in contact with the filling.

In all cases, when we have decided to employ tin-foil, we should feel that we are doing the best possible thing for the benefit of our patients, and that the preservation of the tooth or teeth under treatment is the main object to be considered.

In commending pure tin as a valuable agent for filling a certain class of cavities, I do not wish to be understood as disparaging the use of other materials in common use for filling teeth. They all have their places, and each has its peculiar merit. I simply claim that cases frequently present themselves for our care and attention where tin in its present improved form will serve a far better purpose than any other material which has as yet been brought to notice for securing safety to cavity-walls or cavity-margins, and preserving cavities in which they are impacted a greater length of time, without further deterioration or loss of tooth-structure.

In my paper at this time I have avoided making reference to the various forms of gold employed as tooth-stoppings, and dilating upon their comparative merits, deeming this a fit subject to be brought before the Society on some future occasion.

TIN-FOIL AS A FILLING-MATERIAL.<sup>1</sup>

BY DR. BENJAMIN LORD, NEW YORK.

MR. PRESIDENT AND FELLOW-MEMBERS,—The subject of the use of tin-foil as a filling-material is one, to my mind, of peculiar interest and importance; and the attention that it has received during the last six months is most encouraging, and promises much, I believe, in the treatment of the teeth in the future.

A paper was read a week ago before the First District Society having this title: "Has not Tin-Foil as a Material for filling Teeth been overrated?"

I was very sorry not to be able to attend that meeting, to hear the paper read and listen to the discussions upon it. I do not know what views were advanced or what arguments were used to show that the value of tin-foil had been overrated; but, from my experience and observation, I do not understand that its merits or value can be overrated.

Now, those who place this high estimate upon tin-foil should have some good reasons for it.

It is said that we know the world, or learn the world, by comparison. If we compare tin-foil with gold-foil, we find that the tin, being softer, works more kindly, and can be more readily and with more certainty adapted to the walls, the inequalities, and the corners of the cavities.

We find also that tin welds—mechanically, of course—more surely than soft gold, owing to its greater softness; the folds can be interlaced or forced into each other, and united with more certainty, and with so much security that, after the packing and condensing are finished, the mass may be cut like molten metal.

I contend, moreover, that for contouring the filling or restoring the natural shape of the teeth, where there are three walls remaining to the cavity, tin is fully equal to gold, and in some respects even superior; as tin can be secured, where there is very little to hold or retain the filling, better than gold, owing to the ease and greater certainty of its adaptation to the retaining points or edges of the cavity.

It will be said, however, that tin fillings will wear away. The surfaces that are exposed to mastication undoubtedly will wear in time; but the filling does not become leaky, if it has been properly

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<sup>1</sup> Read before the New York Odontological Society, March 20, 1894.

packed and condensed, nor will the margins of the cavity be attacked by further decay on that account.

Altogether I believe that we can make more perfect fillings with tin than we can with gold, taking all classes of cavities; but it must not be understood that it is proposed that tin should ever take the place of gold where the circumstances and conditions indicate that the latter should be used. Of course, the virtue is not in the gold or in the tin, but in the mechanical perfection of the operation, and tin having more plasticity than gold, that perfection can be secured with more ease and certainty.

If we compare tin with amalgam, we must certainly decide in favor of the former and give it preference; as if it is packed and condensed as perfectly as it may be, we know just what such fillings will do every time. We know that there will be no changes or leakage of the fillings at the margins; whereas, with amalgam, the rule is shrinkage of the mass, and consequently the admission of moisture around the filling, the result being further decay. It is not contended that this is always the result with amalgam, but it is the general rule; yet we must use amalgam, as there are not a few cases where it is the best that we can do; but it is to be hoped, and I think it may be said, that as manipulative skill advances, amalgam will be less and less used. For so-called temporary work, very often I prefer tin to gutta-percha, as it makes a much more reliable edge and lasts longer, even when placed and packed without great care.

Gutta-percha is not infrequently left too long, and the surface of the filling becomes worn or softened, thus leaving the margins of the cavities exposed to further decay; and often, when we come to fill permanently, we find that the cavities are much larger than when we saw them first. I have felt that there was quite a good deal of risk to the best interests of our patients in leaving gutta-percha in the teeth very long, owing to this fact and to the uncertainty and almost impossibility of making perfect margins; yet it is an invaluable material in the treatment of the teeth.

I may say that I think we are now having a better article of gutta-percha than we have had hitherto,—that which is called dentron; it has been brought out by Mr. T. B. Owens, of Boston. The most important quality that I have yet noticed in it is that a much more perfect edge can be made with it, owing to its greater density.

To get the best results from the use of tin as a filling-material two or three considerations are imperative. First, we must have

good foil. I have almost feared that the art of making the best tin-foil was, at least in some measure, lost. I have brought to the meeting some of a lot that Mr. R. S. Williams made about twenty-five years ago, to show to any who may be interested to see it. I have made use of the same lot ever since, and do not observe any change or deterioration in it. I have tried the tin made by Mr. Williams and various other makers since, and have never met with any so tough and strong as this.

Mr. E. Kearsing, of Brooklyn, says that he has developed a new method of making tin-foil. I have tried it, and found it very soft and very nice; the best, I may say, that I have ever used, except that of which I have spoken, which I have been using so long.

Then, secondly, it is very necessary to have suitable instruments. I do not think that the best work can be made with the instruments that are in general use, even by trained hands. If any one does not believe that tin-foil can be made to do all that I have said of it, I would suggest or advise that he try what can be done; and the very best way to give it a trial is to have the teeth in one's own hand, and not in the mouth of a patient. Put the teeth into plaster; take the worst kind of cavities; have suitable instruments and a good foil, and you will soon find that you can do almost anything that you would like to in the way of filling a tooth.

I do not think that serrated points are as good or as suitable as a single point, or what might be called a diamond point, made so by a short bevel of the sides of the instrument at the tip. Be sure always to fold the foil into strips of suitable width for the cavity, and not to use it in rolls or pellets, or in any other form than strips.

Here I may relate an incident. Some twenty-five years ago, I said at a large meeting of dentists that I believed that if tin-foil were used in all cases, considering the hands that fill teeth, more teeth would be preserved; and the sentiment was responded to by the clapping of hands. The idea or thought was that tin-foil required less training and manipulative skill to use it successfully than gold.

The question very naturally arises, Why has not tin been used to a larger extent than it is? Probably one important reason is, because it is not gold, and the popular feeling is in favor of gold, not considering whether it is better or as good as tin.

Another reason may be that many dentists have not learned to use tin, and so use amalgam instead. If I understand correctly, tin is used very little, nor is its use much taught in the dental schools, which, if true, is a grievous mistake.

I have considered, I wish to say, that the "new departure" theory, which was started some sixteen years ago and advocated with a good deal of enthusiasm by some, did not encourage manipulative skill in the use of foils, as it brought plastics into use to such an unwarranted extent that the training of the mind and hands in the use of the former was likely to be neglected.

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### DIET: ITS RELATION TO TOOTH-TISSUE.<sup>1</sup>

BY L. ASHLEY FAUGHT, D.D.S.

MR. PRESIDENT AND GENTLEMEN,—After the bountiful repast in which we have just indulged, how can I presume to say anything to you on the subject of diet. Your gustatory nerves, more than those of other members of the profession, are finely cultivated for the performance of their office. My permission lies in the knowledge that you always take with your dinners a little science as a digestive. The process of alimentation is chemical in its nature, and its relations to tooth-tissue have seemed to lie in an analytic study of foods and tooth-substance. Let us begin here. The carefully-prepared tables of the oft-quoted Bibra are before us. What do they teach? That enamel is largely inorganic, to the extent of ninety-six per cent.; that dentine is seventy-two per cent. inorganic and twenty per cent. organic. If we exclude for the moment the formative period of the teeth, a correct deduction is made that hopeless are all systemic dietary efforts to influence the condition of this outer tissue. Its destiny is largely a fixed quantity. With the dentine lie the greater possibilities. Our interest in it, therefore, cannot but be great. The maintenance of its normal calcific state is of utmost importance. As the inorganic percentage is lowered, its destruction by caries grows more imminent, and with the rise of organic percentage comes that great enemy "sensitive dentine," with its attendant neurotic evils. By the way, how foolish is this term we so frequently use! All healthy dentine is sensitive to a greater or less degree. Hypersensitive dentine more correctly expresses the condition. This is the fiend that unstrings the nervous system of the patient, exhausts the operator, limits too frequently the grand possibilities of dentistry, and has unjustly set pain and

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<sup>1</sup> Read before the Central Dental Association of Northern New Jersey, December 18, 1898.



suffering in the public mind as the synonymes of our profession, though its proudest plume is the gift to humanity of anæsthesia.

Dentists have thus ever felt the apparent necessity of looking towards diet to obtain this needed supply of calcium phos. fluoride.

To continue our study, you and I must now make a chemical analysis of foods to ascertain those which are rich in that substance. But, as with tooth-tissue, so, too, has this been well done for us. We have but to refer to dietetic tables. What our patients shall eat and what our patients shall drink stands clearly presented. Our theoretic study is, therefore, complete. To patients with the indicative condition we prescribe this indicated food. How satisfactory should be the result!

But, gentlemen, it is not. Practice and theory do not so charmingly accord. Twenty years of careful study and observation have convinced me that such teaching is largely bosh and rubbish. Back of those twenty years (the progressive ones of dentistry) the fathers got into their heads the beautiful theory we together have just re-elaborated, and it has been handed down to the present moment as gospel truth. Go carefully through the literature and writings from 1872 to 1893, and be astonished at the beautiful pictures drawn in considering my topic by their ethnological studies. Time and time again is your attention directed to the beautiful teeth and to the diet of primitive peoples,—the Indian, negro, etc.,—and the deduction drawn,—like food, like teeth.

If you will but consider your experience in such practice, I am sure that your results have been even as mine,—largely a failure. You may stuff your patients full of such foods, and the result will be ever the same. The key to a change in the situation lies in a comprehension of assimilation. Only when the patients under this special care can be brought into a condition to assimilate the calcium phos. fluoride which you thus may present to their systems will you be able to upbuild tooth-tissue through such means, and only then to such degree as you may be able to restore the lost power of assimilation. The means at our disposal for the correction and control of assimilation are as many and as varied as the individual cases requiring attention, and in each instance must be governed by the case to be treated. It is impossible to expound any general procedure. It is to be borne in mind, however, that the modifications in the nutrition of the teeth due to food-supply have well-defined limits, and that their nutritive forces are to a large extent influenced by the condition of the nervous system.

A dental axiom in general terms and of wide application may

thus be expressed. The prevalence of tranquillity of nerve establishes conditions promotive of assimilation, and a restless condition existing in *continuance* retards and perverts assimilation.

I have taken this occasion to present this one vital point of my topic, because, while it is appreciated as a general physiological truth, it has been in the past so sadly neglected, instead of being directly connected with all considerations of diet as affecting tooth-tissue.

If time permitted it would be a pleasure to me to now consider with you what I debarred at the outset,—diet during the developmental period of tooth-tissue, infant- and child-feeding; but I leave it to those who may take part in the discussion.

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### A NEW FORM OF RUBBER WEDGE.

BY WILLIAM HEBBERT BOLLINS, BOSTON.

THE chief defect of rubber for separating teeth is the liability of the rubber slipping against the gum and injuring it, as well as making it painful. I overcome this by making the wedge of T-shape. The top of the T is narrow and thin, so as to prevent striking it in eating, but yet it is quite sufficient to prevent movement towards the gum.

The second defect of rubber wedges is that they make the teeth sore, but I find that if they are used in four grades, the thinnest not thicker than thick coffer-dam, the work is done gradually and with the minimum of pain. In my own mouth, at least, there is no other way which I will tolerate.

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## Reports of Society Meetings.

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### NEW YORK, ODONTOLOGICAL SOCIETY.

A REGULAR stated meeting of the New York Odontological Society was held on Tuesday evening, March 20, 1894, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, Dr. Brookway presiding.

The Secretary read the minutes of the last meeting, which were approved.

INCIDENTS OF OFFICE PRACTICE AND CASUAL COMMUNICATIONS.

*Dr. S. G. Perry.*—At the last meeting, Dr. Charles Allan spoke of the difficulty of obtaining rubber-dam clamps accurately adjusted to teeth. I thought at the time of some clamps that I had made about two years ago, and which have been in satisfactory use ever since. They are made in such a manner as to be accurately adapted to the shapes of the teeth, but differing a little from those that are generally used in having the bows so small that the rubber dam does not pull upon them, and also in having substance enough in the body of the clamp to give stiffness and firmness, so that they stay where they are placed. They are made in rights and lefts, three different sizes in each kind, and are adaptable to almost any size of upper molar. I never had time to adapt them to the lower teeth, but some day I hope to do that. They were made after patterns which I made with my own hands, and then I had Mr. Drum copy them for me. They are tempered in such a way that they hold very well. Wherever they are placed they will stay. (Since these were shown I have had a set adapted to the lower teeth, made in the same general way.—S. G. P.)

*Dr. S. E. Davenport.*—It having come to my knowledge that Dr. J. N. Davenport, of Northampton, Mass., was experimenting with aluminum for artificial dentures, I requested him to exhibit a plate before this Society, and he has sent the first one he ever made,—a dummy plate,—and with which, as you will notice, he has taken no pains to give the teeth the proper curves. I presume we have all heard more of the cast aluminum plate than we have of the swaged plate; at least, that is true of myself; and while the latter was not absolutely new to me, it was comparatively so, and I thought it might interest the gentlemen to see it. It is swaged of one piece of metal, the band being turned over, as is often the case in gold work, and the plate etched afterwards, so that the teeth may be attached with rubber. The aluminum for these cases is made by the Florence Manufacturing Company, of Florence, Mass., and the manufacturers, who make it for use in the arts almost entirely, claim that the care taken in purifying the metal makes it of better quality for dental use than that which is usually offered by the dental depots. The metal selected for these cases is American guage, No. 26, of which I have a sample here and will pass it around with the plate. There is one thought which comes to

me regarding the advantage a swaged aluminum plate has over a cast one, and that is the increased density and specific gravity of the metal, which comes from the necessary force given in swaging, while the cast plate, the metal having been so recently fused, must possess less strength and firmness.

*The President.*—Have you any knowledge of its enduring qualities,—whether it lasts or not?

*Dr. Davenport.*—I can say nothing whatever about that, because it is a comparatively new idea with Dr. Davenport. He is only experimenting with it at present, and the reason he was willing to exhibit the plate before the Society was the hope that some of the gentlemen would be willing to express themselves regarding the usefulness of aluminum in this form. He is very anxious to have comments made, and will be thankful for any information from those who have had experience with aluminum plates.

*Dr. Woodward.*—I will say that some two or three years ago I put two entire pieces in a mouth,—that is, upper pieces,—and one of them kept perfectly bright, as bright as the day on which it was put in; while the other one, made of the same metal, at the same time, of the same quality, by the same person, turned as black as could be, and no amount of polishing from day to day would cause it to keep its color. I saw the other piece to-day, and it was as bright as ever.

*The President.*—Were they swaged or cast?

*Dr. Woodward.*—Cast; they were made at the same time and probably of the same material. Both of them had the peculiarity of shrinking away from the rubber, or rather they would leave the rubber. I thought at first the rubber left the metal, but I think now the metal was destroyed probably by the sulphur in the rubber. The plate that is now worn lasts about six months and then requires a new rubber. The lady, however, values it highly.

*Dr. Sanger.*—I had quite a little experience in that line. I swaged a number of plates and put two of them in the mouth, and I had a peculiar experience with one of them. The patient wore it satisfactorily for about a year, and at the end of that time she returned to me with the air-chamber entirely dissolved out of the plate, not worn through. I say that because of the peculiar appearance of the edges. This being the thinnest point in the plate, in swaging it had given out first. The plate showed signs of dissolving at other points, but the air-chamber was out entirely. It rather shook my faith in swaged aluminum plates, and I abandoned them without giving them a further trial. I put this plate in the

mouth of a colored servant of mine, so I could watch it, with that interesting result. I showed that, together with some plates swaged by myself, at a clinic at the New York College of Dentistry, about four or five years ago. There was not much trouble in swaging it. It requires a little care.

*Dr. Littig.*—I have had considerable experience with this class of work. I have always believed the deterioration of the metal was due to some peculiar condition of the secretions of the mouth, caused by the kind of food used, more especially with those who take a large amount of salt. Occasionally we find a certain amount of disintegration of the plate coming up in the form of blisters, and there would be a clayey substance under them. Whether that is due to impurities in the metal or not I cannot say. In some mouths it disintegrates very quickly, and in others the plates wear very well and give good service. I have some that have been worn for a number of years. It is not reliable, however, in this respect. (I am speaking of swaged plates.) In regard to annealing it, by simply putting oil on the plate and then burning the oil off and heating it until it becomes white, that anneals it very nicely.

*Dr. Bogue.*—At our last meeting I was so much obliged to Dr. Perry for his matrices that I thought I would take the liberty of showing one that I have had for a number of years. The manner of using the instrument is to pass the matrix between two teeth, at a point where the matrix is very thin, draw it through until you obtain some pressure, when you will have between the teeth a matrix which is thick at the bottom, towards the gum, and comes to a knife edge at the grinding surface of the teeth to be filled. A bit of thin ribbon steel can be placed between it and the cavity, so if one uses amalgam, the matrix can be drawn down and pushed out again without disturbing the filling, and the steel ribbon removed afterwards.

Another little appliance I wish to speak of. We are often annoyed by the shank of the bur in the engine catching the rubber dam. A tube an inch or two long, that fits over the nozzle of the hand-piece, may be filed away, so as to leave a little finger projecting the same distance as the shank of the bur would project. When this is slipped on the hand-piece, the bur being in place, there is no danger of the shank catching in the rubber dam.

*Dr. Hodson.*—It has been upon my mind for a long time to present to you a very delicate, very simple, but strong, little matrix, which I have used with much comfort for several years, and will, with your permission, present it now.

To premise, I have never felt justified in using the matrix before devising this one, as all others that I have ever seen—excepting Dr. Jack's, and that is thick and requires much space—are practically but straight bands encircling the tooth, and giving convexity but in one direction. One is scarcely better off at the end of using them than with none, as the same straight cut across is left in the former case as the file would make in the latter. In a word, I feel the necessity quite as great for convexity of the stopping from grinding surface to cervix, as from buccal to lingual surface. This I have never seen accomplished by any matrices.

I cut a small piece, sufficient to cover the approximal surface of the tooth, from thinnest ribbon steel, after drawing the temper, then actually stretch, not merely bend, it concave upon a piece of lead by striking with a hammer a small convex tool held upon it; a tiny hole is punched through each side at the extreme edge, in which to insert little pointed instruments when it needs to be moved or withdrawn. This is slid with a curving motion into the space, being helped to its position with, say, a large plugger. If it strikes the cervical edge of the cavity, put a plugger point into the cavity against the edge that catches, and gently pry it away while you push the matrix past it and home. This all takes but three or four minutes to make and apply, though I keep on hand a lot of different sizes and convexities, from which almost any presentation may be fitted.

Once adjusted it fits like a glove, and the stiffness produced by the hammering, combined with the impingement of the convex side against the contiguous tooth, keeps it snugly in place; while, on the other hand, the edges, being free and springy, admit of the production of absolutely perfect filling margins. In some cases—like long teeth—it is prudent to make the matrix narrow, and then slip it upward as the filling progresses. The entire finishing (of course, after very thin burnishers) is accomplished with the thin approximal tapes. So exquisitely do these slips of matrices do their part of the work, that I often build up two contiguous surfaces with no previous wedging, and, while the cervical and other margins are perfect, the two rounded surfaces of the stoppings are so closely adjusted to each other that the floss just catches—as it should—at the convexity. In the case of amalgam stoppings, I usually leave the matrix *in situ* over night, being careful, of course, in its adjustment, that the antagonizing tooth does not hit it.

*Dr. Bogue.*—In continuation of Dr. Hodson's remarks, I would like to call attention to the fact that the matrix which I showed

permits the gold to lap over at all sides of the margin of the cavity except the edge next the gum. This surplus may be condensed at the edges with a thin burnisher, so that the gold is more compact than by the ordinary processes of matrix-filling.

*Dr. Hodson.*—The point I wanted to make was that any matrix I have ever seen (Dr. Bogue's included) leaves a straight surface across or between the teeth almost exactly similar to what a separating-file would leave. Where do we get the value of the matrix under such circumstances? To be sure, they make a curve going between the teeth, but never any rotundity from the cervix to the grinding surface. I never could make perfect rotund fillings by any matrix I have ever seen, with the exception, as before mentioned, of Dr. Jack's, and these are thick and require large space.

*Dr. Carr.*—I will cite a case which has greatly interested me, from the fact that it is the only one of the kind that ever came under my observation. A gentleman, about fifty years of age, consulted me eighteen months ago, suffering from what he believed to be chronic rhinitis. Upon careful examination I found a profuse discharge from the left posterior nares, complete anosmia, and deafness, together with considerable pain upon the affected side. I diagnosed empyema of the antrum, and suggested treatment which he considered rather heroic. Consequently, as he was soon going to Europe, he preferred to wait and consult a surgeon while there. He did so, and found my diagnosis confirmed, which decided him to return to me for treatment. After treating him some time without marked improvement, I made an examination of the floor of the antrum, supposing that the septum of bone often found in the floor had been enlarged so as to divide the sinus into two portions. But, to my surprise, I found a large movable body, located at the point corresponding to the posterior buccal root of the second molar, which proved to be an alveolar abscess. The first and second molars had been removed about ten years previously. Evidently the roots of the second molar had perforated the sinus, and when the tooth was extracted the abscess remained attached to the alveolus. Since the removal of the abscess his hearing is restored, the anosmia is gradually disappearing, and the discharge of pus has nearly ceased.

*Dr. Perry.*—How large was the opening?

*Dr. Carr.*—The abscess was removed by enlarging the original opening to about one inch and a quarter in circumference.

*Dr. Perry.*—I would like to say a word that may be of practical value to some one. An eminent surgeon came to me the other day with one of his fingers wrapped up. He said that, while operating,

a little poison had got under the skin through a slight scratch. I asked him his remedy, and he said the best one he had found was acetic acid, which he applied after sucking the wound. He considered that better than anything he had ever tried. It penetrated promptly and quickly, and destroyed the poison with more certainty than carbolic acid or iodoform, or anything he knew of. He spoke rather disparagingly of carbolic acid, but he said acetic acid would penetrate promptly, and was almost certain to act on the poison and effect a cure. He told me the ordinary acetic acid fluid was used. He is an eminent man, and this hint from such authority is worth noting.

Dr. C. E. Francis then read the paper of the evening, entitled "Soft Foils and Plastic Stoppings."

(For Dr. Francis's paper, see page 356.)

#### DISCUSSION.

*Dr. Francis.*—Since our last meeting I have filled several teeth with tin-foil and some with tin shavings. One of the teeth here exhibited is almost wholly filled with tin-foil, but near the upper border gold was added, and the gold worked as nicely with the tin as if they had been the same metal. I have observed on a number of occasions that manufacturers of appliances, instruments, materials, etc., have been invited to attend meetings of our Society, in order that they might be questioned. I took the liberty of inviting Mr. Kearsing, of Brooklyn, to come here, and if any one wishes to interrogate him, I presume he will be glad to answer questions. Since Professor Darby introduced his new form of tin, I have probably used more tin than in several years previously. The more I use it, the better I like it. There are a certain class of cavities, especially large ones, in which it serves an excellent purpose. I feel safe in using it. I would say, in regard to the fillings in the teeth that are being passed around, the one with a wire attached is filled with Professor Darby's tin shavings, and the others with Mr. Kearsing's tin-foil.

*Dr. Littig.*—Does tin-foil retain its cohesive qualities for any length of time?

*Mr. Kearsing.*—I think it will. There is nothing but the tin there. I think it will hold until some acid gets hold of it.

*Dr. Jarvie.*—Will it oxidize from the atmosphere, and so have its cohesive properties destroyed?

*Mr. Kearsing.*—No, sir.



*Dr. Jarvie.*—How long have you been making this cohesive tin-foil?

*Mr. Kearsing.*—A great many years.

*Dr. Hodson.*—Is there any way of putting the cohesion back again if it should be lost?

*Mr. Kearsing.*—Not that I know of.

*Dr. Lord.*—I suppose that Dr. Francis does not mean that the tin is cohesive as gold is cohesive, but it is made cohesive by properly manipulating it,—that is, we may call it cohesion or mechanical welding. It will not stick without pressure, and without pressure by points. Cohesive gold will cohere or adhere without any pressure.

*The President.*—Does Dr. Francis discover any perceptible difference in the way of working cohesive tin from cohesive gold?

*Dr. Francis.*—It works much more easily, and does not offer any resistance.

*Dr. Ives.*—When you add a fresh piece to your filling, does it cohere? You know how gold does.

*Dr. Francis.*—It seems to cling very easily.

*Dr. Jarvie.*—I have not seen the tin-foil, but the tin shavings will.

*Dr. Hodson.*—A leaden bullet, cut in two and the fresh surfaces rubbed together, will cohere and stick together, so that the fresh surface of the pure metal—gold or tin—would have the same cohesion as the lead.

*Dr. Francis.*—This foil works much better than the old tin-foil.

*Dr. Lord.*—I suppose Dr. Francis does not mean that tin is cohesive in the sense that cohesive gold is cohesive. It undoubtedly has cohesive properties, but not such as the gold has. I do not in the least propose to depreciate this foil, but to call it cohesive tin would not be just the term to use. As we lay one sheet upon another, or fold them together, there is no cohesion, yet in the operation of packing and condensing with proper instruments we can make the filling solid, not unlike molten metal. I should say that this ought to be termed mechanical cohesion.

I have taken the liberty of saying to Mr. Williams, from time to time, that the tin-foil that he made twenty years ago was better than that which he has made since or makes now, but he thinks I am mistaken.

It will be seen that this tin is just as bright as when it was first made, and it works as well. I think it is tougher than Mr. Kearsing's, though not so soft, which is a more excellent quality.

*Dr. Nash.*—Is it the same thickness?

*Dr. Lord.*—Yes, about the same; perhaps a little thicker, and that would help in its toughness.

*Dr. Nash.*—Are the numbers the same?

*Dr. Lord.*—Mr. Williams's is No. 4; Mr. Kearsing's is not numbered.

I have used gold and tin in combination and with great satisfaction. I fold the tin inside the gold in the proportion of about fifteen parts gold to one of tin. In this proportion there will be no discoloration, nor will the tin oxidize nor wash away, and in a short time there will be an amalgamation of the two metals.

*Dr. Perry.*—It seems to me, if I understand this matter, that it is the clean surfaces that make the greater cohesion of the shavings that were cut by Dr. Darby. I was not surprised when I saw the result; it might have been expected. How long that cohesion will stay remains to be seen. I have an idea that it will be lost after exposure to the atmosphere. So with this tin-foil: there will gather upon it gases from the atmosphere which will spoil the cohesion.

*Dr. Lord.*—I have a few thoughts upon the subject, which I would like to present.

(For Dr. Lord's notes, see page 363.)

*Dr. Francis.*—I would much like an expression of opinion as regards the solidity of the fillings in the teeth that have been exhibited this evening. Solid filling only would take a lustre.

*Dr. Bogue.*—There was one feature that Dr. Watkins, of Montclair, brought up the other evening at the District Society that I notice has only been touched upon this evening. It is one of so much importance that I want to bring it up again. He stated that the idea of putting a little tin-foil at the cervical margin of approximal cavities and then covering with gold was extremely bad, because wherever you put a little tin and much gold the tin wasted. If you fill a cavity with tin and gold, it should be little gold and much tin. I think Dr. Lord brought out that idea once before, but in a different way. Wherever a little tin had been made for the gold to go in, I think it has invariably wasted and left a cavity underneath. I think Dr. Lord is right in saying that tin has been largely abandoned because it was not gold. It is much more easily worked than gold, and it has been a great favorite with me from the time I first started in practice; it has been used in children's teeth especially, and with the utmost pleasure and safety.

Now, a word in regard to Mr. Kearsing's remark that the tin would retain its cohesiveness. I think only time can settle that

question, and unless we follow Dr. Lord's example and shut up the tin so its surface cannot oxidize, I see no way to be certain that the cohesive properties will remain.

Wherever pure metal comes in absolute contact with the same pure metal, there will be cohesion, whether it be gold, tin, or lead. Therefore cohesive fillings can be done with tin, and it has been for many years, although rarely. It seems to me the question of what material we use to save teeth should be one of minor importance. The question ought to be that of saving teeth, and the material that we use at one time or another is a question which we should consider after our conditions have been fully discovered.

*Dr. Jarvie.*—If there is one thing I like to do more than another, it is to please Dr. Lord, and so I will take exception on one point as to what he considers the desirable qualities of tin-foil. But before going to that point, let me say that ever since I commenced to practise dentistry I have used tin-foil in certain classes of cavities. I think it is by far the most valuable filling-material we have for cavities in the grinding surfaces of the teeth of children, whether they be temporary or permanent teeth. I do not like the tin-foil as thick as that shown by Dr. Lord, which was made by Mr. Williams several years ago. Tin-foil beaten out thinner than that is, to my mind, preferable; and the reason is that it requires less force to adapt it perfectly to the walls of the cavity and to condense it, and that is a very valuable consideration when we are working upon children's teeth. I do not think that the toughness, as expressed by Dr. Lord, makes very much difference, as long as we get it thoroughly condensed in the cavity. If we get a solid mass of the block tin in the cavity, it does not make much difference whether it is tough or not in the sheet. To my mind No. 4 is not nearly so good for the purpose for which we want it as when it is beaten out thinner. A number of years ago, Mr. Kearsing got out a lot of tin-foil that was not any thicker than No. 3. I purchased from him a number of books at that time, and I am using from that lot to-day. I still have several books that I have not used, and I value it very highly. I suppose I can get more like it, but if I could not, I should be very careful how I used that which I have. It is as precious to me for certain purposes as any gold which I possess.

*Dr. Howe.*—I am very glad that this subject of the use of tin has been brought up for discussion, and that expressions of opinion in its favor have been as decided as they are. I think it is one of the best materials we have, but I am afraid it has been very much neglected by many practitioners. I have used tin-foil quite steadily

and regularly during all the years of my practice. It seems to me that the possibilities of this new tin-foil that has been used by Dr. Francis so successfully must be greater than anything I have used, for the fillings that Dr. Francis has shown in these teeth to-night are contoured to a considerable extent and are finished very handsomely, and show by the finish a great deal of density. I would like to have Dr. Francis state to us what kind of instruments he used to pack with,—whether they were serrated or not, and, if so, whether they were deeply serrated, and whether he used altogether hand-pressure or whether he used mallet force to some extent.

*Dr. Francis.*—In reply to Dr. Howe's inquiry, I would say I used simply the ordinary pluggers with small serrations, the same as I use for gold-foil. Some of these fillings were in great part packed with hand-pressure. I tried the hand-mallet and the automatic mallet, with about the same effect. The foil works very easily indeed, and seems to pack like magic, readily and beautifully. Two of the teeth I held in my fingers, but the bicuspsids were held screwed in a hand-vice. One partly filled with gold is three-quarters tin. I used non-cohesive foil. The first few layers I did not anneal, but the others were annealed.

*Dr. Bogue.*—Were those made with broad points?

*Dr. Francis.*—No; the serrations were very light. The greater part of the filling in each cavity was put in by hand-pressure. One, as I have stated, is filled with Professor Darby's shavings. The tin-foil is more convenient to introduce in the cavities than the shavings.

*Dr. Hodson.*—In respect to the building up of tin-foil (I believe the process to be chiefly one of interdigitation), I am quite sure that I have at home the first tooth I ever filled, twenty-five years since, and that is built up fully a quarter of the crown's size with tin-foil. I think there is nothing specially new about building up tin-foil fillings. I have never used it very much in my practice because my impression has been that its employment was based chiefly upon its non-conducting properties and the assumed facility of its insertion. Inasmuch as it would take me nearly as long to place a tin stopping as one of gold,—granting, of course, equal care with both,—and as I could get equally good results, or better, in respect of non-conduction by treating the surfaces of the cavity walls, I have never felt that I would gain in these respects by using tin. Moreover, my observation has taught me that it wears away very much more than the gold would do in similar exposures, and that, I have felt, made another element of weakness in tin. While in certain cir-

cumstances of life, or in certain circumstances of teeth, there is a use for it, I have never in my own practice cared much for it.

*Dr. Ives.*—I think there is a little mistake about the use of this term cohesive. Dr. Francis, in his paper, leads us to believe he has used that term just as we use it in regard to gold. If you take two sheets of cohesive foil, place them together, and apply the slightest pressure, you can hardly separate them. Now, we do not get that effect with tin. Some years ago I built out a lateral incisor with tin-foil; it was done with sharp points, purely mechanical cohesion forcing them together. Does Dr. Francis claim that if he arrives at a certain point in his filling, and adding another piece of tin, he can, with a gentle pressure, cause it to cohere as with gold?

*Dr. Francis.*—You can with the shavings.

*Dr. Ives.*—If not, the tin-foil is not cohesive in that sense of the word. I believe in mechanical cohesion, but I do not think the tin-foil is cohesive in the sense that gold is.

*Dr. Francis.*—I can take a ten-cent piece and build a cone of tin-foil upon it, and it will be hard and solid. If not cohesion, what, then, is the force that holds the particles together? Possibly I do not understand the term "cohesion" as others view it. I supposed cohesion meant the union of particles of metal or other substances of the same nature when brought together. You can place this new foil one layer on another and unite the layers.

*Dr. Ives.*—Can you do it with a smooth-face instrument?

*Dr. Francis.*—The instruments I use are very lightly serrated. I have not tried smooth instruments.

*Dr. Hodson.*—Might I suggest that in the pure metals the cohesion is produced by the absolute expulsion of the intervening layer of air, and so the molecules of metal are brought into absolute contact. If one lays the clean cut surfaces of two soft metals together, as I suggested a few minutes ago with the bullet, and rubs them together, perfect cohesion is obtained, but the two parts of the bullet must be rubbed together in order to expel the layer of air. To merely lay them together will not make them cohere, and in that sense they are not cohesive, like sticky gold-foil. Similarly, if by any means we could get two layers of tin-foil in the cavity perfectly smooth and clean (the hammered surface is not clean in the sense that the cut one is), and could rub one upon the other, we could probably get the same cohesion as in the leaden bullet.

Adjourned.

JOHN I. HART, D.D.S.,  
*Editor New York Odontological Society.*

## AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, on Wednesday evening, February 7, 1894, at six o'clock, President Smith in the chair.

The paper of the evening was read by Dr. H. E. Cutter, of Cambridge; subject, "A Case of drawing the Lower Jaw Forward;" illustrated by models.

(For Dr. Cutter's paper, see page 353.)

## DISCUSSION.

*President Smith.*—Gentlemen, this very interesting case of regulating, which has been so nicely presented by Dr. Cutter, is before you for discussion, and we shall be glad to hear the remarks of any members upon the subject as the models are being passed about.

*Dr. Fillebrown.*—At what age was this commenced?

*Dr. Cutter.*—The patient was eleven years of age.

*President Smith.*—The plates were all removable at the will of the patient?

*Dr. Cutter.*—Yes, and the patient experienced no marked inconvenience.

*Dr. Bradley.*—And when was it completed?

*Dr. Cutter.*—When the patient was twelve years of age. The work extended over the time when the twelfth-year molars were erupting.

*Dr. Fillebrown.*—Are all the plates off now?

*Dr. Cutter.*—Yes; and I have tried the patient a number of times, and cannot get her to bite in any other than her present way.

*Dr. Bradley.*—May I inquire if this plate was split at all?

*Dr. Cutter.*—It was sawed through the middle. Sometimes I cut a plate in two places and swing one or both sides on a pivot which is inserted after the plate is vulcanized.

*Dr. Bradley.*—I don't think I understand how the lower jaw was moved forward. A plate was first made by which the lower incisors were prevented from striking on the gum; immediately after that what was the next step?

*Dr. Cutter.*—The platform plate, which kept the lower incisors from touching the gum, at the same time caused them to go forward a little.

*Dr. Bradley.*—The movement was not on the bicuspid and molars so much as on the incisors?

*Dr. Cutter.*—That was the point.

*Dr. Brackett.*—Did the wearing of this appliance at the time the emphasis of the bite was upon the lower incisors produce shortening of these incisors?

*Dr. Cutter.*—I think not.

*Dr. Brackett.*—The change in the relative length of the teeth was in the elongating of the others?

*Dr. Cutter.*—Yes.

*Dr. Brackett.*—With reference to the material of the bands to go about the teeth, the essayist made some remarks to the effect that he had used gold. Some one has said that he has had satisfactory experience in the use of German silver; and I understand that anything one may require in this metal can be obtained at Harwood Bros., dealers in watchmakers' supplies, on Washington Street, Boston.

*Dr. Cutter.*—I had to be very careful not to allow the twelfth-year molars to erupt too far. If the plate had been made too thick behind the upper incisors, the twelfth-year molars would have grown up so far as to have prevented the upper and lower incisors from meeting.

*Dr. Wilson.*—How long has this been completed?

*Dr. Cutter.*—Since last summer.

*Dr. Wilson.*—Is the patient still wearing a retaining plate?

*Dr. Cutter.*—No, I had her wear a retaining plate for a long time, simply to hold the flattened position of the front teeth. I saw her quite often and watched the case very closely, and, after making many careful tests, I could not see any necessity for wearing the plate longer. Ordinarily I require a patient to wear a skeleton retaining plate for a year or more, but this case did not require it.

*Dr. Williams.*—I would like to ask Dr. Cutter if this patient apparently had any hereditary tendency?

*Dr. Cutter.*—I think she inherited the tendency from her father.

*Dr. Wilson.*—The upper plate was held in place by the clasps, was it not?

*Dr. Cutter.*—Yes, it was.

*President Smith.*—An interesting point in this connection is to determine just what took place in the forward movement of the lower jaw. Was this movement brought about by the moving of the condyle in the glenoid cavity, or was there a change in the jaw

substance itself? Perhaps Dr. Cutter has made some study of that point, and can tell what, in his opinion, took place.

*Dr. Cutter.*—I have thought of that a number of times, and my own feeling was that the condyle moved forward in the glenoid cavity.

*Dr. Allen.*—May I ask if the bicusps jumped the bite?

*Dr. Cutter.*—Yes, all the teeth jumped forward.

*Dr. Allen.*—I think that in itself is evidence that the change occurred in the angle of the jaw.

*President Smith.*—It has been held by some that the rami of the jaw were bent in such cases. I don't believe that can happen at that age; I would like to ask the opinion of some of those wiser than myself on that point. What do you think, Dr. Andrews?

*Dr. Andrews.*—I believe, if it can be done at all, it is done when the child is young. During the last year I have had three cases where I have been successful in jumping the bite.

*President Smith.*—Do I understand from Dr. Andrews that he thinks the rami of the jaw can be bent to allow of the jumping of the bite?

*Dr. Andrews.*—I think it may be possible at an early age; I have never studied the matter enough to speak positively about it.

*Dr. Stevens.*—One thing occurred to me, Mr. President, in regard to applying the force to the incisor teeth; that is, why were not the incisor teeth moved forward instead of the jaw? It seems to me it would be natural for them to follow the inclined plane.

*Dr. Cutter.*—They all move forward as one body.

*Dr. Stevens.*—Did you put any bands around them to prevent their being drawn forward?

*Dr. Cutter.*—No.

*Dr. Wilson.*—I did not understand that the teeth struck against an inclined plane, but simply against depressions in what is called a platform plate.

*Dr. Cutter.*—The plate was sloped a little, so as to guide the teeth into these depressions.

*Dr. Adams.*—I suppose the teeth were compelled to throw the jaw forward in order to get a comfortable bite.

*Dr. Cutter.*—Yes, and I am surprised how readily they will throw the jaw forward, if you do not attempt too much at a time.

*Dr. Andrews.*—I had a patient a little over twelve years of age, the cutting-edge of whose lower incisors touched the upper gum, so as to irritate it. A platform plate such as Dr. Cutter describes was worn for about two months. The lower centrals, laterals, and cuspids



struck against that plate and allowed the molars and bicuspid to elongate. After a time I found there was one-eighth to a quarter of an inch space between the lower incisors and the upper gum on closing the mouth. The lower jaw was found, however, to have been moved a little to one side, and an unnatural occlusion formed. Another plate, having depressions adapted to correct this bite, was worn for about two weeks and the articulation brought into proper shape.

*Dr. Fillebrown.*—I would like to ask Dr. Cutter how many upper plates he made with depressions advancing forward?

*Dr. Cutter.*—I should say three or four. I could gain only a small amount with each plate.

*Dr. Fillebrown.*—How long did it take you to gain the first jump?

*Dr. Cutter.*—I think it was about a month.

*Dr. Allen.*—Will Dr. Cutter tell us whether the patient had much forward and back mobility of the lower jaw?

*Dr. Cutter.*—About the average amount.

*Dr. Allen.*—Not as much as you finally gained?

*Dr. Cutter.*—No. It would have been impossible for her at first to throw her jaw out as far as she was able to after the regulation.

*Dr. Allen.*—It would be interesting to know just where the change occurred, whether in the movement of all the teeth or at the angle of the jaw.

*Dr. Cutter.*—I think it was at the condyles of the jaw.

*Dr. Wilson.*—I don't quite understand how you arrange the clasps on your plate.

*Dr. Cutter.*—I carry the clasp-wires from the plate between the second bicuspid and sixth-year molars. The clasps were placed in front of the sixth-year molars, so as not to interfere with the eruption of the twelfth-year molars.

*Dr. Bradley.*—Did the patient wear this platform plate when eating?

*Dr. Cutter.*—I think not. I told her that she might take it out during meal-time, but must put it back immediately afterwards. I impress upon patients the necessity of keeping their plates, as well as their teeth, clean during the process of regulation. The teeth of this patient were not particularly strong, yet she brushed her plates so well that I saw no injurious effects from their use.

*President Smith.*—I am surprised that Dr. Cutter allowed his patient to remove the plate while eating. The appliance was arranged to produce a change in the manner of closing the teeth, and yet the patient was allowed to take it out when she ate, and that

is the only time, commonly speaking, when we put our two jaws together.

*Dr. Fillebrown.*—It is not alone when we eat that we put our jaws together.

*President Smith.*—It is safe to say that, as a rule, the teeth stand slightly apart, and for that reason I should think it quite important in Dr. Cutter's case that the appliance should be worn while eating.

*Dr. Stevens.*—I would like to ask the President if he ever had for a week or two a very sore tooth in his mouth?

*President Smith.*—No, I never did, except a little soreness from wedging?

*Dr. Stevens.*—I think if you had had such a tooth, you would have found that you closed your teeth very often during the day.

*Dr. Williams.*—Did Dr. Cutter give his patient any instructions with regard to the method of biting when not eating?

*Dr. Cutter.*—I instructed her to avoid as much as possible closing her teeth in the old way. I cannot say positively that she took her plates out while eating, but I commonly allow patients to remove regulating appliances during meal-time, on condition that they replace them immediately afterwards.

*Dr. Fillebrown.*—The gentleman at my side has reminded me that we swallow many quarts of saliva daily. The teeth naturally close every time we swallow. If you divide the quarts by the approximate amount of each swallow, you can tell how many times a day your teeth are closed for swallowing purposes alone.

*Dr. Allen.*—I am not inclined to accept the theory that the angle of the jaw was changed in this case. Supposing the mobility of the jaw to be so slight as to prevent the patient from moving the jaw forward so as to bring the upper and lower teeth into the relation shown in the models of the corrected case, the change could have been effected, it seems to me, by the very process employed by Dr. Cutter. This would have a natural tendency to stretch the muscles sufficiently to bring the jaw forward the required distance, which, as the models show, is less than the width of a bicuspid tooth. My impression is that the plate used in this case induces a new habit of closing the teeth, due to its effect upon the muscles rather than upon the bones. This was accompanied by a slight change in the position of the bicuspid and molars of both jaws. I have not found that any difficulty arises from the patient's not wearing a plate during meals, for the jaws receive much exercise in the unconscious moments of swallowing. Professor Austin Flint tells

us that we swallow from four to six gallons of saliva during twenty-four hours, and as the jaws are being continually brought together in this process, the regulating goes on, despite the interruptions of eating without the plate.

*Dr. H. A. Baker.*—I would like to ask Dr. Cutter if the jack-screw which he uses in this case is an invention of his own, and if he vulcanizes it into the plate with the screw intact, and of what material it is made?

*Dr. Cutter.*—The jack-screw is made of German silver, and is vulcanized into the plate with the screw intact, but the screw can be freely turned when the plate comes out of the vulcanizer. This jack-screw is the result of certain experiments made by Dr. Andrews and myself.

*Dr. Eames.*—I understood Dr. Cutter to say that the bite was not open when he began the correction of this case; the incisors were in contact with the gum or nearly so.

*Dr. Cutter.*—The points of the lower incisors touched the gum behind the upper incisors.

*Dr. Eames.*—I do not see why in such a case it is necessary to bend the jaw at its angle in order to jump the bite. The moving of the whole jaw forward is all that is required.

*President Smith.*—Our next subject for the evening is the "Artistic Arrangement of Artificial Dentures;" it will be presented by F. S. Belyea, D.D.S., of Brookline.

*Dr. Belyea.*—I have a few drawings which I wish to show. I have tried to find suitable sketches to illustrate my points, but failing to find them, I went to work and made these myself, which I will show to you to-night. These sketches illustrate my motive for using certain mechanical contrivances, which I shall endeavor to describe. My subject naturally divides itself into two parts,—first, the restoration of facial expression; second, the restoration of the teeth themselves. In this diagram I have tried to show the features of a youth of twenty years, and in the next one I have tried to show the same person at the age of sixty, after the loss of all the teeth. In the first picture we find an elevation at the corners of the mouth, and a fullness about the mouth and cheeks. In the second there is a drooping at the corners of the mouth and a general falling in of the cheeks. This change is caused by the absorption of the alveolar processes and a relaxation of the facial muscles through the removal of their natural support. In order to restore the lost fullness, I apply plumpers in the region of the cuspid roots. To a certain extent they draw up the corners of the mouth,

and then, by the application of plumpers at the side, the looseness in the buccal region is filled out. These plumpers are held in place by the muscles. I try to make my plate restore the features, and, in order to do so, I have an outline in wax, which represents the position of the teeth, gives the length, fulness, size, and shape of the arch. Some hold that only one arch should be fitted in every mouth. I do not believe in that theory at all. In getting up the articulation, you must have some idea of the length and position of the end of the teeth. I have noticed failure in many cases of artificial teeth through ignorance or neglect of this rule. If you can see this red line, that is the point from which I try to secure an occlusion. I draw an imaginary line from just below the lobe of the ear to the edge of the central, and in cutting my wax I follow that line and construct my plate accordingly. That principle was set forth in a paper printed some years ago in the *Dental Cosmos*. I think the title of it was "The Artists in Dentistry."

*Dr. Fillebrown.*—I feel that there is a limit to what can be done in restoring the parts to their former condition after the loss of the teeth. When the canine teeth are lost, the pillars of the arch are gone, and when the process has wasted away, as it will, there must be a depression at the side of the nose, which can never be restored. A person at sixty, even if no teeth are lost, will not have the fulness of cheek he had at twenty, consequently it is not reasonable to expect to restore to a person of sixty the plumpness and fulness he had at twenty by the use of any artificial appliance. The fulness of the cheek does not to any considerable extent normally depend upon the presence or pressure of the side teeth, but upon the length of the occluding teeth. A person's cheek falls in not because teeth fail to press the muscles outward, but because the shortened occlusion slackens the muscles, and the cheek falls inward; when the masseter muscle is again put upon the stretch, the cheek is restored to its normal condition. Hence I think plumpers on the side are not ordinarily required, and do not have much to do with restoring the face to the condition which it would have obtained had not the natural teeth been lost.

*Dr. Brackett.*—In behalf of the last speaker, I would say that he has made all these remarks without seeing Dr. Belyea's models.

*Dr. Belyea.*—I must beg to differ most decidedly with the gentleman when he says that plumpers have nothing whatever to do with the holding out of the cheek. I have found that they have an important effect. Of course, I do not pretend to get back to a face of twenty; I try to get it as near nature as I can, and I never

have gotten too near to it yet. Simply opening the bite will perhaps allow the muscles to change a little bit, but they will not draw back this objectionable fulness to any great extent.

*Dr. Fillebrown.*—I did not intend my remarks as criticism of what has been placed before us this evening, but only of the general principle. In years past I have sometimes failed to consider what the normal condition was at sixty years of age, and how many of the lines that I sought to remove were legitimate and should remain. In our endeavor to correct the sunken appearance, we are, I think, inclined oftentimes to overdo it.

*Dr. Bradley.*—I scarcely grasped the idea of Dr. Belyea from the drawings and from his remarks, but seeing the models which have been passed around, I think I can understand it more satisfactorily to myself.

I do not do a great deal of plate-work, but I happen to be working at the present time on a plate for a lady nearly sixty years of age, who lost her teeth through pyorrhœa. The case presented somewhat peculiar conditions, and I worked very faithfully, trying to make a satisfactory plate, and, although the patient wears the plate, yet when she attempts to bite anything off at the front of the mouth, the upper plate will loosen at the back. There is no "ridge," I might say, at the back of the jaw. I am now studying this case over again, and the thought has come to me in looking at this model,—would it be possible to give the impression of fulness which is so desirable by the use of plumpers in the cheek? The face seemed to be in a collapsed state, as it were; there was no natural expression whatever, and it occurs to me that this may help to a solution of the case in filling it out by means of plumpers. I think I shall try it.

*Dr. Belyea.*—Speaking about plumpers in the lower jaw, I have found, in the number of cases that I have had to deal with, that fulness is of not much use, or even allowable, excepting in the bicuspid and molar region. No attempt that I have made to restore fulness lost by absorption in the lower cuspid region has made any very perceptible improvement in the facial expression.

I would say that I never put in a set of teeth for anybody that I do not grind them more or less, even in young people. It adds greatly to the natural appearance of the case.

This case of removable bridge-work that I show is made by the use of Logan crowns. The plate is struck up, the pins are cut off the crowns, and they are placed on, and then solder flowed in between.

This other case is to show a bridge made so that you can set the bridge first, and then the individual crowns afterwards.

WILLIAM H. POTTER, D.M.D.,  
*Editor American Academy of Dental Science.*

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### ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

At the regular monthly meeting of the Society, held February 10, 1894, President Dr. Darby in the chair, upon the conclusion of routine business, the President called on Dr. George S. Allan, of New York, the essayist of the evening.

Before reading the paper, the doctor exhibited two dental appliances, and, in exhibiting them, said,—

"What I wished to show you will be a partial failure. I had asked to have four storage batteries here, but find four gravity cells instead. It is a very compact and valuable electric mouth-lamp, and thinking it might interest you, I brought it over. The voltage supplied by these cells is not sufficient, but may give you an idea of its value. By means of this rheostat,—which is a very small one, and can be made for six or six and a half dollars,—you can regulate the current perfectly. The lamp itself would cost about three dollars and a half. When the current is on, you can, by the aid of this little lever, get a flash light in the mouth. If the lamp is broken it is easily replaced at a minimum cost.

"The other matter that I brought over is one that I showed to Dr. Kirk a year or so ago, and tried to get him to take an interest in it, but he did not do so at the time, and so I brought it over to see what the members of the Pennsylvania Society thought of it. It is a little pan for annealing gold. Oftentimes you have a surplusage of cohesive gold after finishing an operation, and it is awkward to take it up piece by piece. The pan is composed of fine wire gauze. It cuts off the gases on the principle of the Sir Humphry Davy lamp. You can regulate the heat in annealing gold without injuring it, and the gold is annealed in mass instead of piece by piece. I find it answers the purpose."

Dr. Kirk, in response, said, "If Dr. Allan had been at the Columbian Dental Congress, he would have seen a lamp which I think will supersede any of the mouth illuminators we have yet been shown, one which is certainly a unique contrivance. It consisted of a small illuminator, such as has been shown you, but in front or

back of it was a parabolic reflector, made of vulcanite and brightly polished on the inside. The lamp was set in about that way [illustrating it as sheathed in the reflector]. The encasement was carried around in front, and in a socket towards the front was set a glass rod which could be bent in any shape, curiously enough, almost at right angles. This end [illustrating] perfectly plain, and so fixed that the light was reflected or condensed from this parabolic reflector and thrown into the end of the rod and conducted down the rod. The great advantage of this electrode was that it could be bent in any direction, and it could be carried to any spot in the mouth, the advantage being that the rod never became heated, and the illuminating power of the lamp was something remarkable. It made the diagnosis of pulpless teeth perfectly feasible, and has been used for determining the question of the collection of fluids in the antrum. I think that is an improvement in the idea Dr. Allan has shown here. I have sent to Paris and tried to get one of the lamps. The difficulty so far has been the fact that the amount of heat collected and thrown against the bulb of the lamp is sometimes great enough to soften the lamp. For the purposes of illumination I think it is the best arrangement I have ever seen. The arrangement for annealing gold is not satisfactory. He says that the wire gauze cuts off the gases. It cuts off the flame the gases go through."

*Dr. Truman.*—How about the safety lamp?

*Dr. Kirk.*—The gas goes through, but it does not ignite.

*Dr. Allan.*—I won't discuss the question, except to say it works satisfactorily. It anneals gold, does not overheat it, and the annealing is as perfect and complete as with a spirit-lamp.

As to the lamp, what Dr. Kirk refers to it does not affect the construction of this one. It is only something added to it. Further, this one you can obtain, and the other you cannot. This gives ample light and aids greatly in making a correct diagnosis in many doubtful cases. The lamp I intended to bring over was, unfortunately broken just as I was coming away. It has a little vulcanite back to it so that the side that is to be next to the tongue is protected, not only by the rubber shield, but the shield is set in plaster and asbestos, so that you can use the lamp quite a little while before the heat penetrates the plaster and asbestos. It only takes half a minute or a minute to make an examination of a pulpless tooth, so that the heat will not be perceptible.

(Dr. Allan next exhibited some cases illustrating appliances for holding the teeth in place.)

The first represents the case of a patient where a tooth had been brought in place by an elastic, and after a few days a gold plate was made and fitted to the palatal surface of the teeth and held in place by three little pivots attached to the plate and cemented in position. The tooth is now held firmly in position. The patient was about fifty-five years old.

The next represents a case where a second molar was loose. The patient has worn the brace something like four years, giving much comfort and prolonging the life of the tooth. Without it, in a day or two the tooth becomes sore, and if it were removed the tooth would soon be lost.

In the use of sulphuric acid in a ten per cent. solution, with this little platinum spatula, I find I can remove tartar very easily. Ever since Dr. Kirk put in my hands some asbestos fibre, which is as fine as cotton, I wrap a little of it around the blade, and I can carry the asbestos fibre, after dipping it in the acid, around the roots in places that I could not reach in any other way, and by a little mechanical rubbing or abrasion with the asbestos fibre and sulphuric acid the tartar is loosened very rapidly. With this and ordinary chisels you can go over a mouth and remove at least nine-tenths or all of the tartar with it and not injure the gums in the slightest degree, and certainly not the alveolar process.

Dr. Allan then read his paper on "*Pyorrhœa Alveolaris*."

(For Dr. Allan's paper, see page 219.)

#### DISCUSSION.

*Dr. Peirce.*—I have prepared a paper to read this evening, but as it is late, and I desire to hear from others, I will occupy but a few moments. I would like to ask Dr. Allan if he presents these casts as representing cases cured through local treatment? [Dr. Allan answered in the affirmative]. I never in the paper to which the essayist has devoted his criticisms made a single allusion to what is called, and recognized from its color, black tartar. I never made a single allusion to the tartar that was deposited from the saliva—which the black evidently from its location is—as being the cause of *pyorrhœa alveolaris*. I did not say that black tartar was not deposited from saliva, but believe that it is, as every one who recognizes its location must. I never saw a case of *pyorrhœa* occasioned by black tartar; inflammation of the gingival borders of the gums is the extent of its disturbance. It is entirely different from the deposit examined by Professor Congdon, of the Drexel Institute. Different in its location, structure, and color; different in its origin.



Certainly there is no one here who has not recognized the presence of black tartar and its local influence on the gum. It never goes beyond the fifth of the length of the root towards the apical end; it is confined to a locality just under the gum margins.

The tartar examined by Professor Congdon was taken directly from or near the apical end of the root, and where there could be no connection with the gingival borders whatever. His specimens were deposited by or from the plasma of the blood, and could not have come from the saliva, because the locality and structure prohibited intercourse between the parts. The product from the plasma of the blood was what Professor Congdon analyzed, and it was his critical analysis that was published in the paper to which allusion has been made. Dr. Allan says he is not familiar with any one who has taken similar views with myself. I would like to read an extract from a paper placed in my hands two days since by Dr. Faught, which says,—

“I am of the opinion, however, that the deposition of the concretions upon the roots of the teeth in those localities not easily reached by the saliva, or in which the presence of the saliva would be an impossibility, is due to the causes which produce the chalky formations found in the joints and fibrous tissues of gouty and rheumatic individuals.

“The thought has occurred to me, though I have not had time to demonstrate it positively, that the concretions found upon the roots of the teeth in the locations just named were masses of urate of soda with phosphate and carbonate of calcium, and that they are deposited directly from the secretions, as is often the case in rheumatic arthritis.”

Furthermore, it would seem that these concretions were the cause of the inflammatory condition rather than the result of it; in proof of this let me state that clinical observation teaches that suppuration often occurs about the roots of the teeth at remote points from the gum margin, and which have no outlet until the pericementum is dissected from the roots of the teeth by the accumulation of pus. I have seen cases in the lower jaw in which an abscess had been formed upon the roots of living teeth, between the neck and the apex, and in which the attachment of the gum at the neck of the tooth was intact, and the pus did not escape until nature had perforated the soft tissue, or relief was given by the use of the knife. In such cases I have never failed to find concretions upon the root at the point of suppuration; and this could not possibly have been deposited from the saliva, and it is fair to presume that

the deposit upon the root was the source of irritation that produced the abscess, rather than that the inflammatory condition was produced by some remote cause, and the formation of the deposit the result of the inflammation.

Phagedenic pericementitis is sometimes directly traceable to a rheumatic condition of the system or the uric-acid diathesis. In several cases in which I have analyzed the urine, uric acid was found largely in excess of the normal quantity.

In all of the cases which I class as rheumatic, concretions are found upon the roots of the teeth, and many times in locations which preclude the possibility of salivary origin.

Under restricted diet, in which meats, wine, and malt liquors are cut off, there is soon a marked diminution in the quantity of uric acid excreted, and an equally marked improvement takes place in the symptoms manifested in the oral cavity, which cannot be accounted for by the removal of the concretions and local treatment alone. In one case, which has been under observation four years, the periodical aggravation of the oral symptoms are a sure indication of the presence of an excessive amount of uric acid in the urine, and as soon as this condition is corrected the inflammatory conditions of the pericementum are greatly relieved. Local treatment is necessary, but this alone is not sufficient; we must strike deeper and correct the morbid condition of the system if we hope to effect a cure.

That is the testimony of Dr. John S. Marshall, of Chicago, who says he has seen cases where there has been deposit without destruction of the gum margin. It was only last week or within a few days that a patient came to me from Dr. Mary H. Stillwell, of this city, where the left cuspid tooth was as vital as a tooth could be, having an abscess opposite the apical end, and on this end there was a rough incrustation. The pulp was undoubtedly alive.

*Dr. Allan.*—No sinus?

*Dr. Peirce.*—No trace of a sinus or pocket. I have seen three cases exactly like it,—teeth where there has been an abscess and the tooth retained its vitality.

*Dr. Allan.*—You didn't know anything about the end; you didn't extract it?

*Dr. Peirce.*—No, but I examined it without an instrument.

*Dr. Allan.*—Was the incrustation there before the abscess formed, or did it come afterwards?

*Dr. Peirce.*—I assume it was there before the abscess was established, and was to an extent the cause of it.

*Dr. Truman.*—What evidence have you that the pulp was alive in that tooth?

*Dr. Peirce.*—It was not off-colored when there was a strong light thrown upon it; one cannot easily be deceived. It is as certain as it is possible to ascertain anything. Besides, the abscess healed without disturbing the pulp-chamber or canal. Now, in regard to another point. I have in the last three months had twelve cases of pyorrhœa under my charge, and with the exception of three occurring in school-teachers, every one had other indications of gout. There are gentlemen here to-night who can give stronger evidence than this. The association of pyorrhœa with gouty diathesis is certainly so true that it cannot be gainsaid. Let me say that Dr. Allan's paper may be all true from his stand-point. If he did not take the product from blood plasma, he could hardly expect to find uric-acid compounds. Tartar on the apical end of the root is not black tartar, but is of a very different composition. Tartar found in that locality usually comes from the blood, while that on the crown and neck is undoubtedly from the saliva.

*Dr. Allan.*—Referring to this same article of Dr. Peirce's, I find on page 2 the following. But first I would say that in that article he failed to draw attention to a third kind of tartar. In my paper I did not deny that there were cases at times which seemed to point to some other causes of pyorrhœa alveolaris than the purely local one at the neck of the tooth. In his paper, Dr. Peirce refers to a special kind of tartar. In his article in the *INTERNATIONAL DENTAL JOURNAL*, he says, "In the first place, I believe that while pericementitis is associated with calcic deposit, the origin of the calcic salt and the antecedent condition which determines the locality and character of the deposit as well as the train of totally distinct symptoms which follow, lead inevitably to the conclusion that two different diseases have thus far been confounded. In one form of pericementitis the origin of the calcic salt is the saliva, and in the other form, the blood." The calcic deposit Dr. Peirce refers to and the tartar of Dr. Black are one and the same thing. So I was perfectly right in presuming he drew attention to the same kind of tartar referred to by Dr. Black. He says, "The former I shall designate as *ptyalogenic calcic pericementitis*, expressive of the idea that in its origin it is local, peripheral, and salivary. The latter I shall designate as *hæmatogenic calcic pericementitis*, expressive of the idea that in its origin it is constitutional, central, and associated with some modification of the normal composite of the blood plasma." That is the serumic tartar of Dr.

Black. Dr. Peirce fails to draw attention to a third kind of tartar. Now, here he says, "I have had some specimens of this tooth deposit examined by Professor Congdon." A person is very easily led astray if the doctor cannot be more definite, and I can only say that what he refers to is the ordinary black deposit. It is a cause of pyorrhœa, but not the only cause by any means. I have seen cases of pyorrhœa where there was no deposit of any kind that I could detect.

*Dr. Kirk.*—My knowledge of this particular phase of the subject arose two days before I had a conversation with Dr. Peirce upon it. My attention was called to a case that had been sent me over six months ago by Dr. Harrison Allen, for relief of pyorrhœa alveolaris, to see if I could do something to relieve the distress. It has now been over six months since I had the case under observation, extending over three or four treatments. When the patient first came to me the lower incisor teeth and two of his bicuspidæ, as nearly as I could recollect, were affected with pyorrhœa in a form almost as bad as the worst case I ever saw. I told him frankly that I believed it was only a question of a short time before he would lose his teeth; that what I should do would be simply palliative, and would only put off the evil day. As carefully and thoroughly as I could I removed the deposits from the roots of the teeth, and after applying the ordinary antiseptics and stimulating treatment which we give these cases, I dismissed him.

I saw him six months or so afterwards, which was two days before reading Dr. Peirce's paper before the Odontological Society of New York. I noticed that as he came up my stairs he looked brisk, well, and happy, whereas, before, he had the appearance of a chronic invalid. I examined the mouth, and it was as healthy and as clean as any mouth I ever saw. There was a restoration of the tissue, and the mouth was in splendid order. I have treated a great many cases, but never saw such a result. I knew as soon as I saw him that my treatment had not done it. I asked him what he had done. He told me that he had been under treatment all his life for various ailments with but little benefit, but Dr. Allen had put him under a strict gouty régime. When Dr. Peirce was relating the substance of his paper to me I reported this case to him as one which, in my belief, illustrated perfectly the truth of his theory.

It seems to me that the principal point at issue to-night hinges upon the analysis of these concretions and their origin. Two methods of analysis are applied to the investigation of tartar. One by which the approximate constituents are determined, and those

by which the ultimate constituents are determined. The analyses quoted by Dr. Allan are of the sort in which the ultimate constituents alone were shown. If you pay attention to the report of results of the analyses you will observe that the tartar contained so much organic matter, so much water, and so much carbonate of calcium. If any uric acid or urate of calcium had been present, it would in this case be measured in terms of organic matter and calcium carbonate. In other words, it would not have shown uric acid under the circumstances, even if any had existed.

The analysis of tartar which Dr. Allan sent to Professor Ricketts is also faulty in this particular, that it had been collected from pyorrhœa cases with open pockets, and it is tartar of an indeterminate sort; probably a mixture; and yet that analysis did show uric acid present. I have not had a case so far in which I could determine the question whether there is a deposit of concretions around the roots of teeth without some breaking in the gum margin. I believe there is. Personally, I have not made the observation. Dr. Allan says he never has seen a case where there is concretion around the roots of the teeth, without a break in the gum margin; that all cases which he has examined have formed from the gum margin downward. Of course that may be true, because those are the only cases we have been taught to observe.

I have a tooth in my own mouth in which the pulp is still alive, and there is quite a bunch about that root resulting from alveolar abscess. I have four or five teeth which, if I am indiscreet in the matter of eating, become very sore; but since I have been taking especial care in a dietetic way and living within the limits of a gouty régime I have had no trouble.

I have some fifteen patients—pyorrhœa cases—at present under a strict gouty régime, and I hope to be able to report on these later.

I had, a few days since, an opportunity of observing in the case of a lady patient a gouty outbreak simultaneously with an acute attack of pyorrhœa inflammation, where the gingival margin around the teeth was much swollen and painful; her hands showed that she had the typical gouty condition; that she had just been passing through an exacerbation of gout with the acute pyorrhœa inflammation simultaneous with it.

*Dr. Thomas.*—Any one who has been the victim of impaired or perverted digestion will readily recognize the constitutional causes of gout and rheumatism. A few years ago I had occasion to go upon a milk diet for six months, not even eating a cracker in that time. Previously, while getting into the condition which made the

milk diet necessary, I suffered greatly with rheumatic pains and gouty symptoms. After resuming the normal diet it was easy to discover what it was I had eaten that either increased or decreased the rheumatic or gouty symptoms.

There was no organic disease of the digestive organs, but their ability was impaired by reduced nerve-force, brought on by over-work. To eat at one time too much was as bad as to eat or drink articles of food which should be prohibited.

Dentists especially, but people in general, do not get out-door exercise enough to utilize the stronger foods, and should confine their diet to such as will be assimilated readily. This winter I have left beef entirely alone, and my general health was never better, and I have not had a twinge of rheumatism or gout. I have noticed that during the times when I had evidences of imperfect digestion that pyorrhœa always accompanied the condition, the same as gout and rheumatism. Since Dr. Peirce's paper has appeared I have taken pains to inquire of eighteen or twenty patients suffering from pyorrhœa if they ever suffered from rheumatism or gout, and they have all of them answered "yes;" and, upon further conversation, they have all claimed that beef was their principal animal diet, and they did not see how they could get along without it.

*Dr. Jack.*—Dr. Peirce's conclusions tend to establish on definite grounds two different pathological conditions of the peridontium which heretofore have not been clearly differentiated.

In reference to phagedenic pericementitis, it has not escaped observation that thick proliferation of the peridental membrane not infrequently occurred attended by absorption of the alveolar process, but it has escaped my attention that deposits have occurred at the apex of the roots, unless some communication has been established either by fistulous tracts transversely through the tissues or along the course of the peridental membrane, and these cases have mostly occurred with dead teeth. I have, however, observed that in nearly every instance where proliferation of the peridental membrane has taken place it was associated with evidences of the existence of the gouty diathesis.

It is not infrequent to observe attacks of gouty inflammation of the peridontium. Sometimes this structure, from its free supply of nerve-filaments, becomes highly sensitive when neuralgic pain occurs similar to that manifested in the earliest stage of simple pericementitis.

One case in particular is worth being mentioned in this connec-

tion of over fifteen years' observation. At times, more particularly after partaking of wine, the right central would become loose, which, on the second occurrence, was diagnosed to be of gouty origin, which then was questioned by the patient.

Lately a most severe attack occurred, when tumefaction had taken place, with considerable swelling of the gum, simulating the second stage of alveolar abscess. As the tooth was not responsive to alterations of temperature, and was a little off color, I decided to drill to the pulp-chamber to give relief to a condition which I had long feared would supervene. At the half-way distance sensibility was excited, proving a living pulp. This will be perceived to be as clear a case of gout manifestation as if the tumefaction of a joint had taken place. The patient now has large gouty concretions in the joints of some of the fingers.

In one other instance, where the patient was also of a gouty diathesis, distinct abscesses occurred on two occasions of the tumefied gum, and after the evacuation of a single drop of pus, which appeared to be formed in the superficies of the gum. This case was like the previous one with this exception, and also there was a shallow deposit of thin, dark salivary calculus beneath the margin of the gum.

*Dr. Truman.*—The subject has been pretty well handled, and a great deal written about many of its points, until it is somewhat tiresome. I want to express gratification that we seem to be approaching a period in dentistry when individuals have come to the conclusion to work upon matter in the laboratory rather than in their own brains, and it is hoped we will have a better class of papers and intelligence in regard to many things. I want to congratulate Dr. Peirce on his work, although I cannot agree with him in his conclusions. Possibly he may be right, and I and some of the rest of us wrong. He has demonstrated, however, and with a considerable degree of certainty, that uric acid may be found around the roots of the teeth. I cannot believe he has proved that pyorrhœa is a result of this. It may be at times. Dr. Allan has alluded to one point,—that pyorrhœa begins frequently at the apical extremity. We have had it repeatedly stated here to-night that that is true. Now, I think I have had a great deal of experience both private and clinical, and I must say that I never have seen a case that I could positively determine began at the apex of the root. I do not consider it possible from a pathological stand-point that this concretion should occur at the apex of any tooth, covering the point where the pulp enters the tooth, and that pulp remain alive. It seems to

me an impossibility. The very fact that the concretions occur at the apex, and press upon the pulp, would destroy the pulp of that particular root. I know very well that with multirooted teeth we may have two of the roots alive, but the root that is particularly affected will be dead. I will just ask Dr. Peirce to examine one I have with me, and decide whether he would not think that such a tooth was a living tooth if examined in the mouth?

*Dr. Peirce.*—I should think the crown and buccal sides indicate vitality.

*Dr. Truman.*—Allusion was made in the paper to lymph or serum passing from the cementum into the dentine, and in reverse order back again to the pericementum. Now, I believe there is no question at all that fluid can pass into the dentine through the cementum, but as it passes out in reverse order, how can it affect only a certain portion of the pericementum. It should be deposited in the entire tissue. The urates will not disturb any given part unless there be a lack of nutrition in that particular point. In other words, according to the best pathologists, the tissue must have experienced a loss of tone before it can be affected by this gouty deposition. But we find pyorrhœa beginning at the gingivæ. If it begins there, it is in advance of the deposition, and therefore has had a beginning before the urates have been deposited.

If I understand it, we cannot possibly recognize the theory that uric acid is at the foundation of this disease. That it may have something to do with it may be true, but when I find that Dr. Peirce limits the beginning to thirty-five years of age, he is, in my opinion, giving the whole thing away.

I have been studying this subject for the last thirty years, and I am satisfied that pyorrhœa alveolaris does not depend solely upon a gouty condition. It is, in my judgment, independent of any of the deposits, and I cannot agree with Dr. Allan that these are usually found in pockets where pyorrhœa exists. The age limit will not, I think, hold. I have had a number of cases where the age did not exceed twenty.

I feel assured that this disease is mainly local. Constitutional conditions may be present sometimes to increase it. That it is local is evident from the fact that in all cases we can produce it. Take an individual with perfectly healthy gums and irritate them with clamps, ligatures, separators, etc., and nothing done to render the gum aseptic, there will be continued irritation and development of micro-organisms so extended that in forty-eight hours there will be incipient pyorrhœa. If this be true, and I cannot see how it can be



controverted, it cannot be said pyorrhœa is always occasioned by constitutional difficulties.

Dr. Peirce, somewhere in his remarks, said that it is a disease that is rarely cured. If that were so it would be the opprobrium of dentistry. We had better give up our practice entirely. What! cannot cure a simple irritation of the pericemental membrane! I cannot believe it. I know it can be cured.

There came to me, a year or so ago, a very difficult case. The patient had been under the care of a prominent dentist who acknowledged that he could do nothing with it. All the lower teeth were so loose that their salvation seemed problematical. I, however, began the treatment as I understood it. This proved so effectual that in six months time he came and exhibited them to me, and with one exception they were as firm as any in the mouth. The gums were healed and perfectly adherent to the cervical border.

This brings another point. The cement in these teeth was practically dead. There was no pericementum upon them. It seemed impossible that bone could form around the teeth, but it did, exactly as I suppose it forms around implanted teeth. That pyorrhœa can be cured I entertain no doubt, but whether all cases can be is still an open question.

*Dr. Brubaker.*—Though not feeling myself qualified to speak either on the causation or pathology of pyorrhœa, there are several statements in the papers of Dr. Peirce which find confirmation in the field of clinical medicine, and to which I wish to allude.

As to whether a pericementitis which is followed by the phenomena which characterize a case of true pyorrhœa alveolaris begins primarily at the gum margins from a deposit of lime salts from the saliva, or whether it begins near the apical extremity of the root from a deposit of organic salts from the blood, is merely a matter of observation, and should therefore be solved by an attentive study of individual cases.

A matter of the utmost importance at the very outset of this discussion is a definition of terms, so that we may all know just what is meant by the term pyorrhœa. Much confusion and waste of argument may thus be avoided.

Dr. Peirce, in his several papers on this subject, takes the position, if I correctly understand his argument, that (1) a pericementitis attended by a flow of pus may be caused by a salivary deposit of calcium phosphates and carbonates, and (2) that a pericementitis attended by a flow of pus may be caused by a special hæmic deposit

of calcium and sodium urates and free uric acid, but that the train of symptoms and pathological changes which follow these two absolutely different causes are so unlike in many respects that two distinct diseases are to be diagnosticated. If the sketch of the characteristic features of these two forms of pyorrhœa be correctly drawn, and if his observation can be substantiated by the observations of others, the justness of his differential diagnosis becomes self-evident. There is, I am told, a general consensus of opinion among dental practitioners that some cases of pyorrhœa are of short duration, yielding readily to treatment, and that other cases are of long duration, extending through months and years, attended by the absorption of the alveolar process and the eventual shedding of the teeth, and which are practically non-curable. Now, it is this latter form of pericementitis that I, in common with Dr. Peirce and other observers believe to be a local expression of the gouty diathesis, and as such to be treated along constitutional and specific lines; and my opinion is based upon the resemblance of this disease to other local expressions of the same diathesis occurring in other portions of the body. As to the chemical composition of the salts removed from the roots of the teeth by this chronic destructive form of pericementitis there is no doubt in my mind. I know from my own observation of six cases that they were uric-acid salts, and that they were not derived from the saliva.

The statement by Dr. Peirce, that every case of pericementitis which progresses to the stage of pus formation and discharge is not to be regarded as a case of pyorrhœa in the sense in which this term is generally understood, is, I imagine, accepted, by all who have had much experience with the disease, and who possess ordinary powers of diagnosis.

But that such a non-specific pericementitis may, by the addition of a uric-acid deposit, acquire those specific features which characterize true pyorrhœa is most probable. Analogous conditions occurring in all portions of the body may be readily cited confirmatory of this view. A non-specific catarrhal inflammation of the bronchial mucous membrane produced by atmospheric changes or disturbances of the pulmonary circulation, though lasting for a variable length of time, will usually yield to treatment directed to the nutrition of the membrane or to the circulation, as the case may be. Yet there is a certain number of cases which will resist all such medication. This fact, coupled with the observation that bronchitis was frequently associated with gout, induced Dr. Greenhow to investigate the possibility of a causal connection of these

two diseases. From a study of a large number of cases he found that thirty-seven per cent. had various manifestations of gout. In summing up his investigations he states it as his conviction that there is an intimate relationship between the gouty constitution and chronic bronchitis. In many instances where gout has not developed into its characteristic forms it manifests itself in the form of chronic bronchitis. He further states that in many instances no doubt the disease (bronchitis) is first developed by some external exciting cause, though frequently by a much slighter one than would be likely to produce the same effects in a healthy subject. Crystals of uric acid have in several instances been detected in the sputum of chronic bronchitis of gouty people. A gouty pericementitis finds its counterpart in gouty bronchitis. Again, a simple non-specific pharyngitis may take on specific characters when occurring in gouty subjects. In all its symptoms a gouty throat is like no other. The mucous membrane of the palate and pharynx is red, glazed, oedematous, penetrated with turgid veins, and covered with a grayish secretion. In a case reported by Dr. G. de Mussy, masses of urate of lime and carbonate of lime were discharged from the mucous follicles of the pharynx. Inflammation of the parotid glands, of the general mucous membranes of the skin, of the nerves of the viscera may, when occurring in gouty people, develop specific features which would make their relationship incontestable. A gouty pericementitis finds its exact counterpart in a large number of local inflammatory conditions in various regions of the body.

It is therefore highly probable that when pyorrhœa occurs in gouty subjects its continuance is directly connected with uric-acid irritation. An objection to this view as to the pathology of pyorrhœa has been made on the ground that, as in some instances the patient does not exhibit any of the usual symptoms of the gouty diathesis, therefore it cannot be associated with it. Now, the amount of consideration which this objection should receive will depend on the amount of attention the author of the objection has given to a study of the pathology of gout and upon his ability to diagnose the multifiform phases of this extraordinary constitutional condition. When it is remembered that the gouty manifestations are often so subtle and obscure that even the most expert are baffled, is it to be expected that all dental practitioners not familiar with general pathological conditions should be capable of detecting their presence and influence? Yet I have no doubt that even a most superficial examination of the various organs and tissues of the body will reveal some gouty condition in all cases of true pyorrhœa.

As in the practice of general medicine, so I presume in the practice of dental medicine, the specific cause of a disease is frequently determined by the results which follow specific treatment. If some local persistent inflammation of bone, skin, or viscus, or some chronic form of neuralgia, or some peculiar eruption, which resist all local and constitutional treatment, should yield and disappear under some specific remedy, as mercury, quinine, colchicum, and potassium, there would not be the shadow of a doubt that there had been present some remote manifestation of the syphilitic, malarial, or gouty diathesis. Indeed, this is regarded as proof positive in the absence of all other evidence that the local trouble was but an expression of a constitutional disorder.

Now, it occurs to me, from a consideration of the histories and the results of the specific treatment instituted by Dr. Peirce, that we have all necessary proof that pyorrhœa alveolaris is a specific pericementitis caused and maintained by the deposition of uric acid and its salts from the blood into a pericemental membrane, the nutritional level of which has been lowered by some local mechanical or chemical cause.

*Dr. Burchard.*—Any remarks I can make would but serve to corroborate the statements and opinions of Dr. Brubaker. Dr. Allan has said, or quoted as authority Dr. Draper's article in "Pepper's System of Medicine," that the gouty diathesis is not necessarily caused by the presence of an increased amount of uric acid or urates in the blood. This is, on the other hand, regarded by Garrod, Niemeyer, Duckworth, Ebstein, and others as the distinguishing feature of this particular disorder. There is no other means of explaining the phenomena of the disease; even the trophoneurosis theory is the same element involved. Further, one would infer from Dr. Allan's statement that we are to accept the presence of uric acid or urates as an expression of an incomplete retrograde tissue metamorphosis; whatever view we may take as to this, the weight of evidence is assuredly in favor of the production of these substances being through a faulty metabolism. Lauder Brunton's writings upon the function of the liver strengthen such an assumption.

For agreement with Dr. Peirce's observations, Ebstein's theory of gout, "that it is a species of coagulation necrosis in which urates are deposited in the necrotic area," is suggested.

Garrod's experiment for the presence of uric acid in the blood serum should be applicable if not diagnostic.

As Dr. Kirk has said, the analyses quoted by Dr. Allan contain

an element of fallacy; urates, as urates, would through such means be decomposed and give reactions not as urates, but as carbonates. One analysis simply resolves the deposits into individual chemical elements, from which no conclusion can be deduced.

Dr. Peirce and Dr. Truman seem to give different definitions as to the local disease we are discussing, Dr. Truman's bearing the same relation to Dr. Peirce's that the renal effect of a large dose of turpentine bears to chronic nephritis. If the gouty diathesis view be true as a cause of disease in the peridental membrane, we should expect to find the disorder prevalent among brewery-men, who consume large quantities of malt liquors. Gout is a common disease among English porter drinkers. Is phagedenic pericementitis also? that is a question. Dr. Allan's classification into pathogenic and traumatic luxation is too indefinite; it includes but does not place this particular affection.

The form in which we are likely to see this disorder would be in the condition known as lithæmia.

Certainly decided evidence has been presented this evening to show the connection between attacks of pericementitis and the ingestion of undue amounts of nitrogenous food. This does not prove that carbohydrates form no disturbing element; they may act in the production of the gastric catarrh. The exclusive use of certain foods will produce another degenerative disorder, not often seen,—that is, scorbutus. Not that there is any similarity, but it is an evidence of the effect of diet upon health.

Adjourned.

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#### HARVARD ODONTOLOGICAL SOCIETY.

A MONTHLY meeting of the Harvard Odontological Society was held Thursday evening, December 28, 1893, at Young's Hotel, Boston, Dr. Eddy, President, in the chair.

*President Eddy.*—The subject of "Porcelain Contours," Dr. Grant's paper, is now open for discussion.

(For this paper, see page 309.)

#### DISCUSSION.

*Dr. Cooke.*—I would like to ask Dr. Grant if all these wheels which he passed around to-night were made by the same firm in Waltham?

*Dr. Grant.*—They were. Two of these wheels, in the form of saws, are made for cutting off teeth, and they do the cutting very smoothly indeed. There is none of that rasping or jumping that you get from a saw. The gentlemen seem to be accommodating and anxious to make good instruments.

*Dr. Cooke.*—What cement do you use?

*Dr. Grant.*—I have used Caulk's for a long time. It is not as satisfactory as I would like, but it is the best cement I know of.

*Dr. Cooke.*—White or yellow?

*Dr. Grant.*—I feel a little safer when I use the gray.

*Dr. Cooke.*—There was one more point that I did not get clearly. What do you use on the wheel?

*Dr. Grant.*—Alcohol and carbolic acid.

*Dr. Cooke.*—What proportion?

*Dr. Grant.*—About ten to fifteen per cent. of carbolic acid.

*Dr. Giblin.*—Will Dr. Grant please tell us if he would feel confident in fastening the dowel-posts with jewellers' enamel and blow-pipe? It is so difficult to use the furnace that one does not care to do it any oftener than he is actually obliged to.

*Dr. Grant.*—I would say that I have done that with large pieces, but I feel a little safer if it is baked in a furnace, on account of the more even, steady heat. I have fastened metallic pins into pivot teeth with jewellers' enamel, and also with glass, in the way you speak of, and they held securely; but it is risky to try on a tip that you have spent a good deal of time over. The blow-pipe is apt to discolor except with a perfectly blue flame. One is more sure of the color if he gets even heat.

*Dr. Werner.*—How does this method compare for time? Do you think you save time, generally speaking, compared with gold contours?

*Dr. Grant.*—I don't know that I should save time. In the average contouring of a central I should expect to spend from two and a half to four hours.

*Dr. Werner.*—I have never contoured with porcelain except in one instance. My assistant did the work of fitting the piece to be put on. I found he was not very enthusiastic over it, and I think it is very difficult work, too much to turn over to anybody, and yet it seems to be desirable in many cases until we find that ideal filling for which we have been waiting so long.

*Dr. Grant.*—I don't know why I should be any more willing to turn over such a piece of work as that to an assistant than I should a gold filling. One is quite as important as the other, and if you

are going to turn such work over to an assistant, you may as well turn it all over to assistants and take a vacation yourself. I don't like to hear a man urge the difficulty of an operation as an argument against it. We, as dentists, pride ourselves on—and one of the highest claims of dentistry is—the skill in the manipulation that its exponents exhibit. Wherever a new thing is introduced I hear two objections,—first, it takes a great deal of time; secondly, it is hard to do. Now, we should not look at it from that point of view. Every good thing is difficult to do, it does not matter what it is, and the longer I live the more I am convinced of that fact; and as skillful men, which we claim to be, we should not let such considerations deter us from adopting anything which is going to prove beneficial.

*Dr. Hitchcock.*—I would like to ask Dr. Grant if he ever screws on his tips?

*Dr. Grant.*—You mean screw the dowel into the tooth and then set the tip on?

*Dr. Hitchcock.*—Yes.

*Dr. Grant.*—It can be done, but I have found it seldom possible to make such a small thread hold satisfactorily in tooth substance; and besides that, as I said before, there is a great advantage in vitrifying the cement which holds the dowel in the tooth. If set in phosphate, you will be very likely to see the dowel, but if it is baked in there you do not see it any more than you see the pins in a porcelain tooth.

*Dr. Hitchcock.*—I have seen threads hold so firmly that it was almost impossible to get them out.

*Dr. Grant.*—Well, they will not pull out, but they will work out after a time. I have set screws in pivot teeth, and they would come to me so loose that I expected to remove them with my fingers, but I found they did not come out so easily. There is the objection, however, that there is not toughness enough in dentine to properly hold the thread.

*Dr. Giblin.*—Do you serrate the portion of the dowel-post that goes into the tooth?

*Dr. Grant.*—Yes, a little.

*President Eddy.*—I should like to hear a few words from our guest, Dr. Church, on this subject. I know he has had considerable experience in this line.

*Dr. Church.*—Mr. President and Gentlemen of the Odontological Society, I really have not much to add to Dr. Grant's experience; it has been longer than mine. I agree with many of his points.

Though I have never followed out his ideas exactly, I have used the principle a good deal. He is the first one I have heard express the absolute necessity for a perfectly flat, lapped joint for the porcelain tooth to fit against. I have worked many a long hour to get at that perfect color, and have sometimes been almost discouraged on account of the long, laborious work it compels. I have worked somewhat after the Land process, carving the piece on. I do not reach that fine blending of color that I would like, but the results in many ways are such an improvement over, at least, the gold filling, that I consider it ample justification for what I do. I have used porcelain in making inlays to be put over abraded surfaces. It requires a great amount of skill and a very careful adjustment of shade, and I find, as time goes on and I grow more critical of my own work, that the labor does not seem to lessen at all. But even the results that I have reached seem to me infinitely better than adorning a man with the sign-board of a big gold filling on the face of the tooth, and I think that is a point which you are all beginning to appreciate. I have also used it in other ways with a good deal of satisfaction. Take, for instance, a very weak tooth, where one point is abraded and there are cavities, both mesial and distal. Where there is a sufficient material, I have made inlays to fit both cavities, strengthening the weak point, and those teeth have exceeded my expectations. I have one case where several porcelain inlays have been in one mouth for a year and a half now, and not one has yet failed. I think it is a great blessing to humanity to have some sort of riddance from such ornamental things as large gold fillings.

HENRY L. UPHAM, D.M.D.,  
*Editor Harvard Odontological Society.*

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## Editorial.

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### THE ONE DISCREDITED MATERIAL.

IN the early history of dental practice materials for filling teeth were limited to the metals or to the resins, and where a better class of work was demanded there was but one material to use,—gold. It is probable that lead was first used, but as the distinction between



tin and lead was not made until the fourth century, it is reasonable to conclude that where lead was stated, tin really was meant. The use, therefore, of the latter as a filling-material is lost in the mists of antiquity.

Of one thing, however, we may feel assured, that at no period has this metal been regarded with favor by the majority of practitioners; indeed, it has remained the contemned material from the beginning by the many and by the few treasured as next to gold, the most valuable filling-material in the list of metals.

The history of tin, as far as we have it, is one of the most curious and interesting of any part of dentistry. At the period when materials were limited, it found but little favor. It was the stuff for the poor, and it has been from that time to the present, in the opinion of the majority, unfit for the good teeth, but able to perform a fairly reasonable service for frail structures. It has been the "ugly duckling" of the dental profession, and if it becomes in the end the graceful "swan," it will have been through tribulations unspeakable.

Harris says of it, in his fourth edition (1850), "Properly prepared it will sometimes effectually preserve the organ, but if the fluids of the mouth are very much vitiated, or should they at any time afterwards become so, it soon oxidizes and turns black, and then, instead of preventing, it rather promotes a recurrence of the disease."

Taft (1877) writes, "Some cases seemingly favorable to its use are found, on examination, to be otherwise; and in almost any mouth in which there is a large proportion of mucus secreted, it cannot be depended upon for permanency."

From these two quotations—and more could be given—it is seen that this metal has occupied a discredited position; and, while at times used, it was always under an implied protest.

The manufacture of tin into leaves, similar to gold, while accomplished with apparent ease, was not attended with equally good results. Gold, in the form of non-cohesive and eventually cohesive, was supplied to the dentist in various forms, but tin received but little attention. The renaissance of this material, if we may judge by the discussions in our various societies, is at hand. This was begun at the World's Columbian Congress, and supplemented by the able presentation of Professor Darby before the Second District Dental Society of New York. This exhibit of what could be done with tin under modern processes of manufacture and proper manipulation has seemingly aroused much interest, with a prospect that

this much-abused metal may yet take its rightful place in the royal line of materials.

In view of this probable result, it may not be inappropriate to review some of the objections urged against it. The following quotation is taken from the *Dental Cosmos* of May, 1894, in an article by R. C. Brewster, M.D., D.D.S., on tin-foil, in which the writer almost pathetically gives his experience in its use, for he says, "To this end I bought book after book of tin-foil, that which was freshly beaten and that which was old, and did my level best, using serrated points, broken points, and smooth points, with hand-pressure and the various kinds of mallets, although a combination of hand-pressure and hand-mallet, with finely serrated points, worked the best, . . . and yet," he says further on, "I could never condense such a filling to make it a solid homogeneous mass."

We have no doubt of the ability of the writer, and it would seem that he had exhausted every conceivable means and methods in his efforts to use this material. It cannot, therefore, be justly charged to lack of energy. It has been the experience of every dental educator that in any given class of students there will be a few unable to manipulate gold-foil, and all efforts, with the best instruction and the most satisfactory form of instruments, fail of any result. With some this is a natural defect never overcome, with others it is simply that they have not been able to strike the right cord and are out of harmony with their work. The time comes when suddenly a new inspiration falls upon these, and they advance in the use of gold beyond their fellows. It is a well-known fact that some of our best operators have gone through this experience. It is, therefore, assumed that our friend needs a new inspiration.

The objections that it oxidizes, turns black, is easily penetrated by an excavator, disintegrates, will not bear the force of mastication, its preservative properties overrated, and, finally, it has no cohesive property, if true, should condemn it.

Now, what are the facts? If properly packed in the cavity, it does *not* turn black, but simply slightly changes its color, in many cases not more than gold, and rarely equalling in this respect the best preparations of amalgam. If well inserted, it will be found difficult to penetrate, but in this respect it is not equal to gold. It will not disintegrate in proper positions more rapidly than gold, if equally well inserted. It will bear the force of mastication with remarkable results. This has been demonstrated in the experience of the writer in many cases of twenty-five years' wear on masticating surfaces. Its preservative properties have been so severely

tested, and have proved so valuable in connection with its poor conducting qualities, that this constitutes an important reason for its more extended use. The objection that it is non-cohesive cannot be sustained.

All metals possess the property of cohesion under proper conditions; tin is no exception.

The use of tin was limited because of inferior manufacture. Good tin, in the form of foil, must be throughout bright upon the surface. Where it is spotted, streaked, or entirely coated with oxidation, it should be rejected.

The writer spent much time twenty-five years ago in efforts to improve the quality of tin then in the market. It was found that by shaving pure tin the pieces were perfectly cohesive, uniting without pressure, in the same manner and with the same force as cohesive gold. This property proved, however, evanescent, the metal losing this perfect cohesive property by oxidation, rendering it of no practical value. Dr. Darby's original investigations reintroduced this quality at the meeting named, creating much interest. The manufacture of tin-foil has greatly improved of latter years, and it is now sufficiently cohesive for all practical purposes.

A mistake has probably been made by operators in using short serrated instruments. The old-style long and sharp serrations are to be preferred.

The preparation of the tin for use is of some importance. It should not be folded on itself, but cut in strips, packed by hand, and consolidated by the mallet.

One quality tin possesses, so important that it is surprising it has not been noticed,—that of working almost as well under water as when dry. No other metal or plastic filling will give equally as good results thus treated. This is a most desirable quality, especially for use in children's teeth, where the difficulties from moisture are almost insurmountable. All that is required is to keep the filling well syringed as the operation proceeds. So well assured is the writer of the value of this and the lasting qualities of fillings of tin placed in under water, that in children no attention is paid in practice to dryness, and rubber dam and napkins will be found unnecessary. Equally good results can be obtained in mature mouths.

Tin, therefore, in the sense of use, is a royal metal to the dentist, and while the supply-houses show by their reports that it is a discredited material, we are very sure that there is a large minority who would not part with it for their own comfort and the good of their patients.

## Bibliography.

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**THE ETIOLOGY OF OSSEOUS DEFORMITIES OF THE HEAD, FACE, JAWS, AND TEETH.** By Eugene S. Talbot, M.D., D.D.S. Third Edition. Revised and Enlarged, with four hundred and sixty-one Illustrations. W. T. Keener Company, Chicago, Ill., 1894.

This, the third edition of Dr. Talbot's work on deformities has been so increased in number of pages, illustrations, and valuable material that it is practically another book added to the former editions.

These were carefully reviewed as they appeared, and nothing can be added to strengthen the conviction that the work of Dr. Talbot stands, upon the subject upon which it treats, as the most important contribution yet given on the osseous deformities of the head and face.

While the conclusions may not be always accepted, the careful arrangement of facts must prove of immense value in determining disputed questions, and will form a basis for the solution of many intricate problems and racial defects.

The general trend of the author's work may be gathered from the following quotation: "The law of the 'survival of the fittest' affects not only the entire organism, but also the parts themselves. Some one part attains undue development. Such a product of degeneracy once obtained might, under proper conditions, remain, while the rest of the body returned to the normal type. The frequency with which these stigmata of degeneracy are found in otherwise sound systems indicates that the law of atavism tends to eradicate as well as to cause them. Given these deformities in a subject of normal mental health, they simply indicate that a more or less remote ancestor had been subject to the influence of the factors producing degeneracy, but that in the main the offspring were regaining the normal standard.

"The lesson to be drawn from these stigmata is the hygienic one that, given the tendency to degeneracy shown in these deformities, the progress of that person under the factors named will tend more towards disease than that of the person in whom they are absent. The frequency of these deformities should hence have early created the suspicion that they were of constitutional and

not local origin, and should have once more taught the old, old lesson in medicine,—that a knowledge of man's ancestry is of great value in treatment."

Space will not permit a thorough analysis of this work; indeed, any review would be unsatisfactory, as it belongs to a rare class of books that requires careful and prolonged study, and this it must receive in order that it may be comprehended.

Chapter XXXIX. consists of a series of thirty-six plates illustrating "the upper jaws of boys from an orphan asylum, ranging from six to twelve years of age," also thirty-six pages with outline "antero-posterior and lateral illustrations of the vault."

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## Obituary.

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### RESOLUTIONS OF RESPECT TO DR. EAMES.

THE St. Louis Dental Society met on May 1 at the Missouri Dental College. During the meeting the following resolutions were adopted:

*Resolved*, That in the death of Dr. W. H. Eames this Society has lost a valuable member, one deeply interested in the progress of his profession, and for years a prominent supporter and contributor to its leading journals. This Society gratefully acknowledges his services in advancing its interests and preserving the high standard of dentistry. We extend our heartfelt sympathies to his bereaved family, and mourn with them the loss of a devoted husband and father, our brother, of whom it can be truly said, that those who knew him best loved him best.

*Resolved*, That copies of these resolutions be furnished to the dental journals for publication and a copy be sent to the bereaved family.

A. H. FULLER.

JOHN. G. HARPER.

WM. N. MORRISON.

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## Domestic Correspondence.

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### SPONGE GRAFTING.

ASHTABULA, OHIO, April 14, 1894.

TO THE EDITOR:

SIR,—In answer to Dr. M. L. Rhein, page 249, April INTERNATIONAL DENTAL JOURNAL, "How shall we restore lost tissue?"

dissect away gum, remove all deposits and affected bone, replace lost process with sterilized (in an oven) sponge, close wound, steady the teeth; nature does the rest. Sponge acts as nucleus for the bone pabulum, and, being an animal substance, is absorbed and carried off through the circulation.

S. A. PANCOAST, D.D.S.

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## Notes and Comments.<sup>1</sup>

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**THE INDEPENDENCE OF CHARACTER.**—It is easy to live in the world after the world's opinion. It is easy to live in solitude after our own. But the great man is he who, in the midst of the crowd, keeps with perfect sweetness the independence of his character.—*Emerson.*

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**THE ART OF THINKING.**—In writing upon the subject of thinking and reading, Dr. T. B. Welch says truly, that it is easy and entertaining to read an article which tells you something which you knew before and which you can indorse, but you learn nothing by reading it. It often requires an effort to read an article which contains real information, however plainly expressed. It has to be studied, applied, digested, criticised; the suggestions raised by its perusal have to be followed out to their conclusions; and to conscientiously read an article of this character is a task which some men are inclined to shirk, just as a lazy man might shirk a physical task. But compare the man who shirks with the man who reads, and you will find the first a mental bungler, the second the acute and able thinker, the man whose head saves his hands, and who is valued, respected, and trusted with the conduct of work and administration of affairs, and rewarded accordingly. Always read a little ahead of yourself. Read matter which requires effort on your part to understand. The effort will not only place you on a higher intellectual plane, but the mental exercise will develop a habit of accurate thinking which will be of more value to you than volumes of average matter read only to be forgotten.

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<sup>1</sup> The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 212 South Fifteenth Street, Philadelphia.

**THE RELATIVE MERITS OF FILLING-MATERIAL.**—A very interesting and practical paper upon the subject of filling-materials was read before the Second District Dental Society of the State of New York by Professor E. T. Darby, and is published in the March issue of the *Dental Cosmos*. After reviewing the history and essential qualities of the different filling-materials, the doctor gives some personal experiences, and closes the essay with the following pertinent remark:

"The ideal filling has not yet been found; but it will surely come. There is no better field for the dental chemist to labor in than this. He may come upon it as by accident, or it may require months or years of patient experimentation, or it may come to him in dreamy visions of the night, as an inspiration. It matters not how. But when he shall have combined in a plastic material adaptability, impermeability, indestructibility, non-conductibility, absence of shrinkage, and harmony of color, then shall his name be engraved upon the pinnacle of fame, and the dental profession throughout the world will rise as one man and call him blessed."

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**CARE AND PRESERVATION OF EYESIGHT.**—Dr. L. Webster Fox, in a lecture published in the *Journal of the Franklin Institute*, discusses eyesight in middle life and old age, and gives certain suggestions for its care and preservation, from which the following notes are made: In addition to the well-known effects of tobacco and alcohol upon the optic nerve, it is pointed out that the drinking of beer and wine leads to changes in the crystalline lens. Deleterious influence upon vision is ascribed also to constricting articles of neckwear, owing to the impeding of the return column of the blood. Touching the question of type-writing, Dr. Fox advises that, if there is any visual defect, after the prescription of the proper glasses, if round finger-tips or keys are used, a change should be made to a machine having rectangular keys, which, in his experience, are the least hurtful to the eyes. Among the concluding hygienic hints, the following are given: Up to forty years of age the eyes should be bathed daily with cold water. After the fortieth year, the eyes should be douched morning and evening with water as hot as can be borne, followed with cold water.

## Current News.

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### PENNSYLVANIA STATE DENTAL EXAMINING BOARD.

THE Pennsylvania State Dental Examining Board will meet for the transaction of business at Cresson, Pa., commencing on Tuesday, July 10, 1894.

W. E. MAGILL, Erie, Pa.,  
*President.*

J. C. GREEN, West Chester, Pa.,  
*Secretary.*

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### CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held in Kindergarten Hall, April 3, 1894, the following officers were duly elected for the ensuing year:

J. H. Wolley, President; C. E. Bentley, First Vice-President; D. M. Gallic, Second Vice-President; A. H. Peck, Recording Secretary; H. A. Costner, Corresponding Secretary; E. D. Swain, Treasurer; J. J. Whaley, Librarian; J. N. Crouse, Director.

HENRY A. COSTNER,  
*Corresponding Secretary.*

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### MASSACHUSETTS DENTAL SOCIETY.

THE Twenty-ninth Annual Meeting of the Massachusetts Dental Society will be held June 7 and 8, 1894, in Massachusetts Institute of Technology Building, Boston. A very interesting meeting is promised. Dr. J. N. Crouse, of Chicago, is to be a guest of the Society, and will deliver an address. There is to be a banquet Thursday evening, at which Governor Greenhalge, of Massachusetts, and President Eliot, of Harvard, are expected to be present. A cordial invitation to be present is extended to members of the profession.

EDGAR O. KINSMAN,  
*Secretary.*

CAMBRIDGE, MASS.



## FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

At the annual meeting of the First District Dental Society of the State of New York, held April 10, 1894, the following officers were elected for the ensuing year:

Victor Hugo Jackson, President; James W. Taylor, Vice-President; Benjamin C. Nash, Secretary; John H. Meyer, Treasurer; and J. Bond Littig, Librarian. Delegates to the Dental Society of the State of New York, George Evans and George H. Rich, each for four years, and M. L. Rhein for one year.

B. C. NASH,  
Secretary.

## CONNECTICUT VALLEY DENTAL SOCIETY.

THE Thirty-first Annual Meeting of the Connecticut Valley Dental Society will be held at Holyoke, Mass., June 20, 21, and 22. A cordial invitation is extended to members of dental societies.

GEO. A. MAXFIELD, D.D.S.

## Selections.

### THE DANGERS OF ACONITINE.

DR. FERRAND (*La France Médicale*, No. 47, 1893), in a discussion in the Medical Society of the Seventh Arrondissement of Paris, would have aconite rejected,—erased from general use. Even in very slight doses it is prone to give rise to accidents. He knows of a fatal case after a slight dose. Certain patients are intolerant of the drug, and cyanosis, syncope, etc., may follow very small doses. Even the tincture of aconite, in doses of ten drops, will cause toxic symptoms to appear. Intolerance is more frequently observed with aconitine than with any other drug. There is both cardiac and cerebro-spinal collapse. A case was cited where death occurred after administration of a milligramme ( $\frac{1}{100}$  grain) of aconitine and five decigrammes ( $7\frac{1}{2}$  grains) of antipyrin. The antipyrin seemed to augment its effects. Dr. Sottas would not like to see it thrown out of the *materia medica*, for he has found it of

value in headaches which have resisted all other remedies; especially in a case of an old syphilitic, who suffered from terrific headache, did it do good service.—*Cincinnati Lancet-Clinic*.

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### MERCURIC CHLORIDE.

PROBABLY no fact in connection with bacteriology has been more assiduously instilled into the minds of medical students (and pharmaceutical too, for that matter) than the surpassingly powerful antiseptic properties of solutions of corrosive sublimate. Although the disadvantages of mercuric chloride, owing to its corrosive and poisonous nature, have been generally recognized, no doubt—save, indeed, by the very heterodox—has been cherished as to the efficacy of the germicidal action of the compound.

As a matter of fact, it would seem that Koch—to whose experiments and statements the booming of sublimate was largely due—exaggerated the value of the antiseptic or overlooked the differences which must be reckoned with between laboratory experiments and clinical experience. Undoubtedly the coagulating power of mercuric chloride is practically a serious hinderance to its usefulness.

These reflections lead up to the announcement—and startling enough it proved in English medical circles—of Sir Joseph Lister, that he has entirely abandoned the use of sublimate in favor of carbolic acid. He characterizes a five-per-cent. solution as “more trustworthy as a germicide for surgical purposes than corrosive sublimate, and in other respects greatly to be preferred.” A great advantage of phenol seems to be that it “has a powerful affinity for the epidermis, penetrating deeply into its substances and mixing with fatty materials in any proportion.”

Looked at broadly, this expression of opinion by our most eminent apostle of antisepsis may be taken as indicative of the gradual revolution (or evolution) which is taking place in surgery. The use of antiseptics has evidently reached its zenith, and now reaction is setting in towards asepsis, the aim of which is rather to prevent the access of pathogenic micro-organisms than to attempt to destroy them *in situ*.—*London Letter, Bulletin of Pharmacy*.

# THE International Dental Journal.

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No. 7.

## Original Communications.<sup>1</sup>

### ELEVATION OF TEETH IN THE SOCKETS.

BY J. N. FARRAR, M.D., D.D.S., NEW YORK CITY.

(Continued from page 211.)

ELEVATION of the teeth, or, as it is sometimes erroneously called, "elongation" of teeth, has in the past been regarded a hazardous operation, because so slight force is necessary to move them, that they are liable to be forced too far from their former places. Twenty-five years ago the plan of operation was to tie sheet-rubber to the neck of the "short tooth" in such a way as to draw upon it by being stretched over the ends of the adjacent teeth. In 1879, Dr. A. N. Chapman hit upon the greatly-improved plan of tying a string about the neck (under the gum) of the tooth to be elevated (or to a knot on a wire bound around the neck), and then drawing the extremities of the string over a stiff piece of wire extending from over the end of one adjacent tooth to, and over, the end of the opposite adjacent tooth, the wire being held on these adjacent teeth by two small saddles of gold plate, one of which was soldered to each extremity. The only defect in this plan was that there was nothing but the loop of the draught-string to prevent the tooth from being drawn too far. This defect I overcame by soldering a third saddle

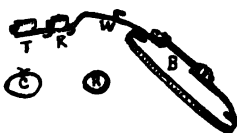
<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

(or a trough) to the middle of the bridge-wire, for lodgement of the moving tooth when it is drawn to its proper place.

To perform these operations more easily, I have devised several mechanisms, some acting by elastic rubber, some by wire springs, and others by screws. Some of these are only modifications of the Chapman mechanism. Omitting those that are similar to Chapman's, and passing over most of those acting by elastic rubber and by metallic springs, a few will be presented without going into details of the operations.

Fig. 19 represents a mechanism acting by elastic rubber, designed for elevating a left upper lateral incisor. This consists of a rubber

FIG. 19.



Elevating mechanism acting by elastic rubber ring (A).

ring, R; a piece of platinum wire, C; clamp-band, B, having a wire arm, W, projecting from its anterior part, and having soldered to it two troughs, T, K, and three hooks. In applying this mechanism, the wire C is first made to encircle tightly the neck of the tooth to be elevated, leaving a *twisted knot* on the labial side. The clamp-band is then fastened on the left

bicuspsids, leaving the trough, or saddle, T, to ride on the end of the left central. After this, the rubber ring is caught on the knot on the wire C, and stretched through the hook under the lateral, thence to and caught on the hook near the anchor band.

*Wire Spring.*—Figs. 20 and 22 represent two modifications of mechanism acting by wire springs. Fig. 21 represents application of Fig. 20.

Each of these consists of two springs (S), a ferrule for the "short tooth," and either a saddle, or three caps, on the sides of which the

FIG. 20.



FIG. 21.



FIG. 22.



Elevators acting by springs.

springs are attached (by soft solder). Having cemented the ferrule on the "short tooth" and placed the saddle on the edges of the front upper teeth, the springs are caught on the hooks on the ferrule. When the teeth are crowded, a piece of platinum wire bound around the neck of the tooth to be elevated is preferable to a ferrule, because it does not increase the crowd.

Fig. 23 illustrates an operation for elevating a right upper lateral. The mechanism consists of a ferrule clamp-band, B, and a wire hair-pin-shaped spring soldered to the posterior nut. On the extremity of the lower arm is soldered a saddle, T, to rest on the end of the right central. The other arm rests on a hook on a ferrule, F, on the lateral. The tooth is acted upon by a sliding ferrule, O.

FIG. 23.



Operation by an elevator acting by a spring.

FIG. 24.



Operation by an elevator acting by a sliding nut.

*Screw-acting.*—Fig. 24 illustrates the application of a similar mechanism. Fig. 25 illustrates a similar operation and a similar mechanism, but acting by a screw instead of a sliding nut. This

FIG. 25.



Operation by an elevator acting by a screw.

FIG. 25'.



The mechanism.

mechanism, represented separately by Fig. 25', is, in my opinion, the best mechanism ever devised for elevating a tooth in its socket. This one, which was for elevating a right upper lateral, consisted of a clamp-band, B, and a screw, S, having two wire arms, A, A, with saddles, C, V, a collar wire, W (platinum), for the neck of the lateral to be elevated. In applying the mechanism, the wire W is first made to encircle tightly the neck of this lateral, leaving the knot (twisted) on the labial side for one of the arms to ride on. The anchor-band is then fastened on the right bicuspid, leaving the saddle C to rest on the end of the right central and the saddle V directly under the lateral, but not in contact with it. This mechanism is operated by turning the screw S so that its head forces the upper arm A downward, as indicated by an arrow. To insure against depression of the central it is sometimes well to have its saddle rest on both centrals.

Figs. 26 and 27 represent a mechanism for an operation for ele-

vating a right lower lateral. The mechanism consists of a clamp-

FIG. 27.

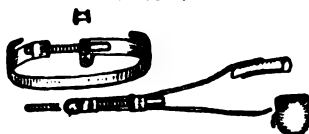


FIG. 26.



Elevators acting by screws.

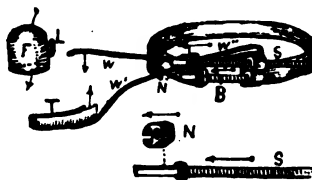
band, two screws, two wire arms, and a ferrule. The wire arms, which are attached by a rivet to an eye below the anterior clamp-band nut, are operated upon by a screw in the double posterior nut, pushing along the wires a flange nut riding on the collar between the screw and its key nib.

Figs. 28 and 29 illustrate an operation and mechanism for elevating left upper lateral. This hair-pin mechanism is made similar

FIG. 28.



FIG. 29.



Elevators acting by screws.

to the one represented by Fig. 26, the difference being mainly in the attachment of the wire arms W, W to the posterior nut of the clamp-band B, being made by solder instead of a rivet. The screw S, by pushing the flange nut N along the wires, as shown, causes the extremities to approach each other.

Figs. 30 and 31 illustrate an operation for elevating a left upper cuspid by scissors-shaped arms, W, W, operated by a screw, S. The

FIG. 30.

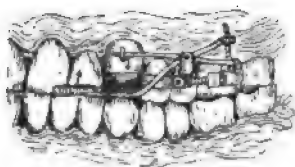
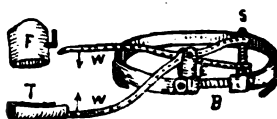
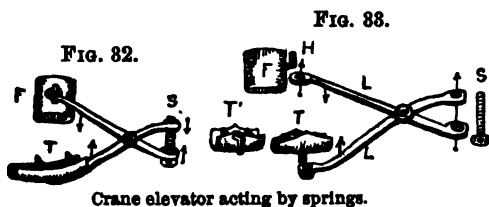


FIG. 31.



jointing and anchoring of the arms is made by a rivet through two ears, E, soldered to the anterior nut of the clamp-band B.

Figs. 32 and 33 represent my crane elevator. After the broad ferrule F is cemented (with phosphate of zinc) to the tooth to be elevated, the upper arm L is caught on the hook H. The trough T is next placed on the ends of the teeth adjacent to the one to be acted upon, and then the screw S is placed in the holes in the other ends of the arms, which are then tightened. The crane-like arms are then swung into the mouth and left behind the lip or cheek-tissues. This mechanism is practicable, but too fancy to be equal to the one represented by Fig. 25, which is the best of all these my inventions.



## THE HISTORY AND CLINICAL APPEARANCES OF SYPHILIS, WITH ESPECIAL REFERENCE TO THE DANGERS ARISING FROM ITS ORAL MANIFESTATIONS.<sup>1</sup>

BY CHARLES M. WHITNEY, M.D.,<sup>2</sup> BOSTON.

SYPHILIS may be defined as a constitutional disease, contagious in character, chronic in course, and capable of transmission by heredity and by the inoculation on any portion of the body of an indefinite substance known as the syphilitic virus.

The name itself, possessing a peculiar significance,—a companion of swine,—was first applied to the disease in a mythical poem written in 1521 by a Veronese physician, one Hieronymus Fracastorius, who describes a mysterious complaint with which a herdsman called Syphilus was afflicted by the god Apollo as a punishment for paying divine homage to King Alkithous, instead of to himself.

In attempting to locate the starting-point of this now widely prevalent and destructive disease much time and labor have been spent. Certain exostoses and other changes found in prehistoric bones have been accepted by some as evidences of the existence of the disease at that period. By others descriptions in Chinese treatises written 2000 B.C. have been considered typical of

<sup>1</sup> Read before Harvard Odontological Society, January 25, 1894.

<sup>2</sup> Surgeon to the Genito-Urinary Department of Boston Dispensary.

syphilis. By others still, passages in the sacred writings of the Hebrews have received the same interpretation. Although there is no doubt that some form of local venereal disease existed as far back as literature itself, there are many objections to accepting any of these theories as to its origin.

Until the latter part of the fifteenth century the evidence of the existence of this disease is vague and unsatisfactory. Four hundred years ago, in the year 1494, Charles the Eighth of France was carrying on a campaign in Italy, and during the winter of 1494-95 was besieging Naples. It was at this time that an epidemic of a then new disease occurred among the soldiers, alarming in extent and destructive in effect. This, then, is the first known outbreak of the disease in question, and it is to Marcellus Cumanus, a Venetian army surgeon, that we owe the first description of it.

Many ingenious theories were devised to account for this sudden uprising of the disease. By some the corruption of the atmosphere on account of the prevalence of severe floods in Italy in the year 1494, by others the influence of the stars, were assigned as causes.

Several years later attempts were made to prove that the disease was imported from America by Columbus and his men. A statement by an Andalusian surgeon, Ruy Diaz de Isla, written in 1512, that he had treated cases of this disease among the men from the ships of Columbus before they landed, has been chiefly used as an argument in favor of this view.

But, inasmuch as Columbus landed at Barcelona in April, 1493, it is remarkable, if this view be correct, that the disease did not originate there instead of at Naples. The explanation most generally accepted at the present day is that the disease had existed in a mild form throughout Europe, and at the period mentioned the aggregation in one place of eight thousand men leading the loosest of lives, aided possibly by the debilitating effects of the peculiar atmospheric condition, had rendered circumstances peculiarly favorable to a general outbreak of the disease.

From this time syphilis rapidly spread through Europe, being extremely severe in character for the first ten years, and later assuming a milder form not far different from the form seen at the present day.

As new countries have been discovered and settled, this disease has kept pace with advancing civilization, until to-day no country is free from its destructive effects save Iceland and certain portions of Central Africa.



To acquire syphilis, two factors are necessary,—the virus and an abraded surface of skin or mucous membrane through which it may enter the system. The nature of this virus has received careful investigation at the hands of bacteriologists, but as yet with unsatisfactory results.

In 1884, Lustgarten described a bacillus, resembling closely the tubercle bacillus, which he had constantly found in syphilitic lesions. Other observers have found this bacillus, but the question is still undecided. The great drawback to experimental research in this direction is that animals are not subject to this disease, and inoculation of cultures cannot be made. It seems extremely probable that some form of micro-organism is present which enters the circulation, and that the resulting symptoms are produced by it or the products from it. Although the disease is most frequently acquired during sexual intercourse, this is by no means the only way, other lesions than those upon the genitals being quite as contagious and more dangerous from the lack of knowledge concerning them.

For the sake of convenience we divide the course of syphilis into three periods,—primary, secondary, and tertiary. Contact of the virus with a broken epithelial surface having occurred, absorption takes place through the lymphatic circulation, and the original abrasion may entirely heal. We have now the first peculiarity of this disease, a period of incubation. After about three weeks there appears at the point of infection the first symptom of syphilis, the initial lesion, or, as it is also termed, the chancre.

Presenting frequently a simple red, elevated spot, it slowly becomes larger; and varying with its location we have another of its characteristics, a dense cellular infiltration about its circumference, which gives a firm, indurated, board-like feeling to the surrounding structures. The softer the tissues in which this is situated, the more marked this becomes. In certain situations—for example, the finger—it may be entirely absent.

Gradually increasing till an ulcerated surface of varying size is formed, differing in appearance according to the locality involved, this shows no tendency towards healing, but remains stationary after a certain size is reached. We now have a second period of incubation averaging about six weeks, when the secondary stage of the disease is reached.

During this period of incubation evidences of the lymphatic, absorption of the poison can be found in the glands nearest to the primary sore,—upon the genitalia, those of the groin, upon the fingers, the epitrochlear, and axillary, upon the lip, the submaxillary.

These are enlarged, and present the same hard—usually painless—condition. The second stage is ushered in by feverish sensations, sore throat, pain in the bones, headache, and feelings of general malaise. Closely following these there occurs upon the surface of the body an eruption of rose-colored spots or blotches, closely resembling that of measles. This may cover the whole or only a portion of the body, is devoid of any subjective sensations, produces no discomfort whatever. It lasts two or three weeks, and disappears with a slight scaling of the skin. At the same time there occurs a general enlargement of the lymphatic glands throughout the body. The sore throat gradually disappears, the headache diminishes in severity, the initial lesion may shortly heal, and the patient may be lulled into a sense of false security.

Wide variations are frequently present: the sore throat and headache may persist, or the secondary rash may be replaced by others of a more severe character, but in the majority of cases the early secondary symptoms pursue the course outlined above. There now recurs a third period of quiescence, presenting no such regularity in course as the previous ones.

In rare cases nothing more may be seen for years, but the disease eventually asserts itself in some form. Usually closely following the disappearance of the secondary rash certain changes occur in the hair-bulbs, the nutrition of the hair becomes impaired, and baldness may result. Not infrequently the eyebrows or beard fall out. Later other lesions may be present on the skin,—papular eruptions, pustules disappearing by the formation of crusts, so that the whole body may be irregularly covered with them. To describe in detail even a small part of the various skin lesions would be outside of the limits of this paper, but it will suffice to say that they are wonderfully varied both in character and degree. The nails become brittle, crack, and may fall out. Coincident with these changes there occur certain characteristic lesions in the mouth and throat, to which I wish presently to recur in some detail.

As the disease progresses there appear the especial lesions of the tertiary stage. These develop usually after a lapse of two to five years, and are characterized especially by a tendency to involve the deeper and more important structures, viscera and organs of special sense. There occurs in this stage the formation of circumscribed cellular infiltrations,—a form of new growths known as gummata, which undergo a process of degeneration, producing deep ulcerations and their effects. In the relentless course of this disease no organ or structure is spared: deep ulcerations occur in

the various mucous membranes; the voice may be impaired or lost; the nasal bones may be destroyed and the organ replaced by a hideous hole in the face; the hearing and sight may alike be destroyed from lesions of these organs. The brain and spinal cord are frequently affected, and paralysis, insanity, and death may result. The coats of the blood-vessels may become the seat of changes leading to the formation of large aneurismal growths, alike destroying life. Frightful deformities, interfering alike with function and personal beauty, actual destruction of life, may result before this direful disease has spent its force.

Happily, to view for a moment the reverse side of the picture, but few of these dreadful calamities are seen in properly-treated cases.

Nor are its effects limited to the person affected; children that are born of syphilitic parents may bear traces of the ravages of the disease in deformities of face or form, or loss of some important function. In them there is no regular succession of stages, but there are present the later and more serious lesions already alluded to. The one symptom which is of interest to this Society is a peculiarity of the permanent teeth which is doubtless perfectly familiar to all of you, consisting in a notching of the central upper incisors, known as Hutchinson teeth, from the English syphilographer who first called attention to them.

Leaving, then, with this brief sketch of its symptoms and its results, the subject of general syphilis, I wish to call your attention to certain peculiarities of the disease which are found in the mouth. The lesions in this region are second to none in importance in the whole body. Among the earliest to appear, the most obstinate and rebellious to treatment, and most apt to recur, of any of the symptoms, they are, in the early stages at least, the most contagious. There can be no doubt that more cases of extra-genital syphilis are acquired from them than from any local lesions elsewhere upon the body. It is this fact which gives to syphilis its chief interest to the dental profession and constitutes its chief danger. Patients who are perfectly aware of the danger from the primary lesion are ignorant of the risk of oral contamination, and spread the disease among the innocent.

Syphilis as seen in the mouth and throat presents five forms: the primary lesion; erythema,—that is, a localized congestion or redness; the mucous patch; gummata; ulcerations, superficial and deep, and their resulting cicatrices.

The primary lesion, most frequent upon the lower lip, may be

found anywhere in this region, even as far back as the tonsil. It varies in appearance with its situation, being often a grayish ulcerated surface, again a hard, painless bunch, its usual form upon the lip. The erythema or congestion occurs at the same time as the secondary rash, and consists in a diffuse redness of the posterior parts of the mouth, chiefly on the soft palate and uvula, often having a butterfly arrangement, usually sharply defined from apparently normal mucous membrane at the junction of the hard and soft palate.

We occasionally see, however, many small red areas scattered over the roof of the mouth and on the cheeks, corresponding to the blotches upon the skin. This form lasts but a short time, either completely disappearing or changing to the third and most important form of oral syphilis,—the mucous patch, as it is termed. In number these patches may be one or many, and consist in whitish spots of varying size and shape, closely resembling the ordinary "canker spots" so often seen. Their usual situation is upon the inside of the lips and cheeks, upon the gums and tongue, especially when it comes in contact with the sharp edge of a tooth. When these patches exist in the corner of the mouth very troublesome cracks may result. They are somewhat sensitive to both heat and cold. Appearing first eight to twelve weeks after the primary sore, they are the most important of any of the lesions in this region.

Again and again, when the disease is supposed to be under control, and when no symptoms exist elsewhere upon the body, these mucous patches appear. Present alike in early and late syphilis, they are a constant source of danger. They are extremely contagious, and infect the saliva so that it, too, may convey the disease. Any local irritation favors an outbreak of these. They may change by a process of degeneration to superficial ulcerations.

Gummata are not frequent, but when present are found in the soft and hard palate and tongue especially. Their chief importance is in their terribly destructive action. Frequently in a few hours ulceration may occur, and a perforation or destruction of the palate result. The cicatrices resulting from these lesions have a very important diagnostic value.

From the foregoing description it will be seen that while these manifestations are often perfectly clear and distinctive of syphilis, it not infrequently happens that only a few scattered patches are present which bear a close resemblance to the common and harmless "canker spots." Being obviously, in most cases at least, unable to closely question the patient, how shall the dentist determine

from physical signs alone one variety from the other? From the appearance of the local lesion itself it is often quite impossible to determine this, but, bearing in mind these general physical signs, he should look carefully for them.

Those accessible to ordinary inspection are: eruptions of various sorts; glandular enlargements, especially behind the ears and at the back of the neck; thinning of the hair, and especially of the eyebrows, with or without the presence of scabs in this location; and cracks or scars at the corners of the mouth and on the tongue. If any or all of these be present, it would afford strong presumptive evidence of the syphilitic nature of these patches. If these symptoms are all absent, he cannot hastily conclude that the affection is of an innocent nature.

The question naturally arises as to when these lesions cease to have contagious properties. It is the generally accepted opinion among syphilographers that late tertiary lesions are not contagious, some placing the time limit at three years after the primary sore, others at five. Although this may doubtless be true, yet no careful person would venture to expose himself even at a later period. The safe view to take is that any lesion occurring in the mouth at any period may be contagious, and to take precautions accordingly. In addition to these various lesions, the blood from a syphilitic patient possesses markedly contagious properties, a fact to be kept in mind in extracting teeth, and in other similar operative procedures.

From these various sources danger presents itself to the dentist in two ways. By contact of the saliva or secretion from these lesions upon an abraded spot in his hand a chancre may result, or by the deposition of the virus upon the various instruments, inoculation of other patients may occur.

The subject of extra-genital transmission of syphilis has received considerable attention of late years, and literature abounds in instances of it.

Dr. L. Duncan Bulkley, of New York, the foremost authority in this country upon the subject, has carefully and laboriously collected the evidence, and in his book, "*Syphilis in the Innocent*," shortly to appear, has presented a startling array of facts. He has also presented such facts as are of interest to the dental profession in a paper read before the New York Odontological Society, and published in *INTERNATIONAL DENTAL JOURNAL* for August and September, 1890.

It is to this, which should be read by every dentist, that I am indebted for many of the facts which I shall presently lay before

you. The thought may very naturally occur to one unfamiliar with the subject, that if the method of infection is so common, why is it that we so rarely see it? why is it so uncommon to hear of an instance of it among dentists? The most reasonable explanation of this is to be found in the very natural diffidence which every individual who is the subject of syphilis, acquired innocently or otherwise, has to informing the community of the fact. It is to answer such criticism as this that I desire to lay before you the evidence that we possess on this subject,—the plain facts rather than any theories.

Dr. Bulkley has compiled a table of 9058 cases of extra-genital chancre, showing the locality in which they were situated.<sup>1</sup> Of these cases, the affection existed in the mouth and throat in 1504 cases, divided as follows: in the buccal cavity, 734 cases; upon the tonsils, 307; in the throat, 264; upon the tongue, 157; upon the gums, 42. Of the remaining cases there are 3249 which may reasonably be attributed, from their location, to infection from mouth lesions. These are divided as follows: upon the lip, 1810; the breast (from suckling infants), 1148; the chin, 146; the cheek, 145. This makes a total of 4753, nearly fifty per cent. of all the recorded cases which may have been produced by some form of oral syphilis. Besides these there are 462 cases where it existed upon the fingers and hand. These are facts collected from the practice of clinical observers who are competent judges of the nature of this disease.

Inasmuch as these recorded cases are but a small proportion of those which have occurred, who shall say that the danger is not worthy of careful consideration? Especially is this true in those branches of medicine which involve operative procedures about the mouth and throat.

Syphilis may be contracted from these various lesions, then, in two ways,—by direct contact or by contact with any article upon which the virus has been deposited. Of the first form instances are extremely common: surgeons and obstetricians have received the primary lesion upon the finger, and have in turn inoculated others before the nature of the trouble was recognized. Bites and tooth-wounds have also contributed their share, very many being reported.

A case which illustrates this method in a most vivid manner came under my observation two years ago. A young man of

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<sup>1</sup> "System of Genito-Urinary Diseases. Syphilography, etc." Morrow, vol. ii. p. 69.

twenty-eight, strong and healthy, by occupation a bar-tender, in endeavoring to forcibly eject a man who was "fighting-drunk," struck him a blow upon the mouth and teeth, slightly wounding in so doing the knuckle of the middle finger of the right hand. The abrasion caused him no great inconvenience for about three weeks, when it became more tender and increased in size until an ulcerated surface the size of a ten-cent piece resulted. This refused to heal, in spite of vigorous treatment, and upon the occurrence of a perfectly typical rash the diagnosis was established. At this time he first came under my observation. He was put under treatment; the original lesion quickly healed, but a few mucous patches remained. He was cautioned regarding his domestic relations, and these directions were obeyed, except that he continued to kiss his wife on leaving and returning home. About three months later his wife came to the office with a chancre upon the lower lip and the evidences of constitutional syphilis.

From the original case another person was infected at the same time. In attempting to aid the first patient in ejecting this drunken syphilitic, a young man of thirty years was bitten upon the fingers, and he, too, developed a digital chancre and its resulting constitutional symptoms.

Another method of direct infection from lesions in the region under consideration is that of kissing. As seen by the cases already cited, the resulting chancre may be upon the lips or any part of the face, or the virus may be conveyed by the food or saliva to the deeper parts,—the tongue or tonsil.

They are by no means uncommon. I have seen six or seven of them, and other observers many more. The reported instances in which dentists have been infected in operating are by no means many, but the general impression among those paying special attention to the subject is that it is rather common. Bumstead states that he has known of several cases. Taylor makes a similar assertion. Dr. Bulkley reports four cases, one a personal experience reported by the dentist himself, another by Neunet, where infection occurred from the scratch of a tooth; another by Otis, which illustrates a peculiar method. A dentist received a chancre of the lip, caused by holding an instrument in his mouth while operating upon a patient who had a few mucous patches. The fourth, by Hutchinson, caused by a tooth-scratch. Besides those reported by Bulkley, Morrow gives a plate in his atlas showing a chancre upon the finger of a dentist. These recorded cases, and the strong presumption that many others have occurred, clearly show that care should be used.

Of instances of indirect contagion literature abounds. Any article which can possibly be brought in contact with a syphilitic lesion has produced the disease. There is apparently no end to the curious and interesting methods.

In 1577 an epidemic occurred at Brünn, by which one hundred and eighty people were inoculated by a cupping-glass in use at the bath. An ear specialist in Paris inoculated sixty people with a Eustachian catheter.

Pipes, musical instruments, forks, knives, spoons, children's toys such as trumpets and whistles, feeding-bottles, tooth-brushes, pencils,—in short, any article which can be transferred from mouth to mouth has carried the disease. An instance is on record of three workmen who were inoculated by biting pieces of thread from a ball which had been used in a like manner by a fourth, who was syphilitic. Public drinking-glasses, glass-blowing, coins, tacks and nails used in common by upholsterers and shoemakers, have all added to the cases. Tooth-transplantation has resulted in the development of a chancre.

Hundreds of interesting examples are found of indirect means, the mere mention of which would more than occupy the time allotted for this paper.

Of instances of inoculation from dental operations, Dr. Bulkley has recorded fifteen, the details of which may be found in his paper.

Such facts show most distinctly and clearly the care which should be taken in cleaning all instruments. The instruments and appliances used by the dental profession should receive the most painstaking attention.

Metallic instruments may be safe by boiling for half an hour in a 1 to 100 soda solution (a tablespoonful of washing soda to a quart of water). Others may be made tolerably safe by immersion in 1 to 10 creolin or pure carbolic acid. Mouth-mirrors seem to me particularly dangerous, and in a recognized case of syphilis a separate mirror should always be used. Towels and the like should be well boiled. In a word, surgical cleanliness will avoid the danger of indirect transmission of this disease.

Careful inspection of the fingers should not be neglected by the dentist, and any abrasion, particularly about the nail, should be brushed over with contractile collodion. In fresh tooth-wounds instant washing and the application of 1 to 500 sublimate solution or 1 to 10 carbolic solution should be resorted to. By these various means comparative immunity may be had from this insidious disease and its far-reaching effects prevented.



In conclusion, I desire to express my thanks to this Society for the privilege of presenting this paper, and for the opportunity of reviewing such facts as science has clearly established in relation to this subject. It is only by concerted action on the part of the medical profession that a great danger to the public health can be lessened.

It is not possible to fully accomplish this until public sentiment is aroused to the fact that this disease is not alone one occurring among the immoral and unclean, to be discussed under the breath, but that it exists boldly in our midst among all classes and conditions, threatening health and even life itself in the ordinary business and social relations.

When medical men, aided by other learned professions, shall have the courage to describe the disease as it is, its frequency and its dangers, we may expect an irresistible public demand for measures which shall limit its spread in the community.

Until this is done the innocent must suffer with the guilty, and the yet unborn will pay the penalty for parents' ignorance. If this paper shall have served to recall to your minds these facts, its object will be fully accomplished.

[Seven hospital cases, showing oral lesions of this disease, were brought by Dr. Whitney to illustrate his paper.]

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## OCULAR HEADACHES.<sup>1</sup>

BY CHARLES F. STACEY, M.D., BOSTON.

MR. PRESIDENT AND GENTLEMEN,—It was with much pleasure I accepted your kind invitation to read a paper before you to-night, and truly appreciate the honor. The subject which I have chosen may not seem a very important one, but when you stop and consider the large number of people troubled with this painful affection, who often go many years, and perhaps a lifetime, with only temporary relief, and that by continual use of drugs, which soon lose their effectiveness, and at the same time leave more or less of a bad result on the general system, it seems to me, as eye-strain is the principal factor in such a large proportion of cases of functional headache, or migraine, that it should be worthy of more than a passing thought.

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<sup>1</sup> Read before the American Academy of Dental Science, Boston, March 7, 1894.

I cannot agree with Lauder Brunton, who declares that the most common causes of headache are decayed teeth and irregularities of vision. But I recognize the fact that the proper treatment of decayed teeth may be the only relief in some cases of headache, whereas defects in vision are the direct cause in a very great number.

It is not to be wondered at that the statement of one writer, that all migraine was due to eye-strain, was received with decided opposition by careful observers; but during the last few years, by the combined efforts of oculists and neurologists, eye-strain has come to the front as a most important factor in this troublesome affection.

In Pepper's "System of Medicine," the article on Cephalalgia, or Headache, by Wharton Sinkler, under Sympathetic Headache, reads, "The headache from eye-strain may be considered in this connection, and deserves careful consideration. Many people have suffered from headache for years from this cause without its being suspected."

Weir Mitchell, in 1876, brought prominently to notice the frequency with which headache may be caused by defects of vision, and later, in 1891, he again called attention to this important subject in a very able paper.

Previous to this the general practitioner seldom recognized eye-strain as a cause of headache. It is now becoming a very common occurrence for the family doctor to refer cases of persistent headache, where the cause seems obscure, to the oculist, for examination of the refraction of the eye; and out of such cases I do not think I overstate it in saying that seventy-five per cent. or more are entirely, or to a very great extent, relieved from headache.

One of the most important facts in consideration of ocular headache is the pain. It has all degrees of severity; it may be more or less constant, or interrupted; it may be associated with the use of the eyes in reading, writing, or sewing, or any near work; also, from attending church, theatre, or concert, or from excessive mental or manual labor. The regions most frequently complained of are frontal, occipital, post-ocular, parietal, throughout the head, and in exceptional cases in the neck, arms, and shoulders.

Bright light, noises, locomotion, worry, or any mental strain, odors (as tobacco), usually increase the suffering. The most comfortable condition for the patient seems lying down in a darkened room with cooling lotions on the head, and perfect mental inactivity. But the best and most effective treatment for permanent relief is correction of the eye-strain by proper glasses.

Ocular headaches are very often not associated with poor sight. It is the rule that small errors of refraction, where the sight is excep-

tionally good, are often the cause of most troublesome symptoms; whereas the refractive error may be very large and the sight very poor, yet the symptoms may not be at all annoying. Thus it is not to be supposed that people whose eyesight is perfect, as far as they can judge, will be easily prevailed upon to adopt glasses as a curative measure in cases of headache.

Another fact must be mentioned: the eye-strain may remain latent for years and cause no troublesome symptoms, when by sickness or poor health, or an increased sensitiveness of the brain, either from mental or moral causes, it may make itself suddenly apparent.

The primary defects of the eye that cause derangements elsewhere are essentially functional in origin and result. They are principally errors of refraction and accommodation, classed under the name of *Ametropia*, or defective sight, and include *astigmatism*; *hyperopia*, or far-sightedness; *myopia*, or near-sightedness, separately or in combination.

The results of the above defects in the eye are called eye-strain.

J. J. Chisholm considers that *astigmatism* is a very common cause of headache, and that the class of persons in which it occurs are healthy people,—young, active, and industrious. They all suffer more or less with eye-pain and headache, which they call *neuralgia*,—a term that they have learned from their family doctor.

Mittendorf studied one thousand cases of ocular headache. He found an unusually large number of school children and college students, as well as women, who have had but little out-door exercise, and whose muscular system was undeveloped, were among his patients. He lays much stress on out-door exercise and gymnastics, as well as glasses, in the treatment of these cases.

Out of his one thousand cases the causes were: *Astigmatism*, eighty-three per cent.; *hyperopia*, or far-sightedness, eleven per cent.; *myopia*, or near-sightedness, two per cent. One hundred and nineteen were near-sighted *astigmatism*, seven hundred were far-sighted *astigmatism*.

Two hundred cases of ocular headache taken from my own records agree very closely with Mittendorf's report.

In my cases the causes were: *Astigmatism*, ninety per cent.; *hyperopia*, eight per cent.; *myopia*, two per cent. Of these, ninety per cent. received marked or entire relief from headaches by the aid of glasses.

Time will permit me to consider only briefly the three principal causes of ocular headache, taking them in the order of least importance.

## MYOPIA, OR NEAR-SIGHTEDNESS.

This causes the smallest percentage of ocular headaches, because in this defect in the sight the eye-strain comes in distant vision; and unless a man leads a life different from the great majority, his eyes are used three-quarters of the time for near work, and he often is satisfied with poor sight for distance, the strain in looking off being unnoticed. There are two kinds of near-sightedness:

*First.*—Elongation of the optical axis, the eye being too long from before backward.

*Second.*—Increased curvature of the lens or cornea.

It is congenital sometimes, especially among the poor. A great many children develop it after twelve or fifteen years. Eight per cent. of the community are estimated as being myopic. It is caused in many cases by unfavorable conditions at school, such as room, light, attitude of the head, distance of the book or paper, and duration of study.

Myopic people are, as a rule, easily embarrassed, and more fond of books than society; given to sedentary habits rather than outdoor, active pursuits. Their poor sight cannot be cured, but can be corrected by the adoption of properly-fitted concave or minus glasses for constant use.

## HYPEROPIA, OR FAR-SIGHTEDNESS.

This causes about one-tenth of all ocular headaches. In this affection, the opposite of myopia in most respects, the sight is very good for distance, but apt to blur for near. The eye-strain is continual, for the ciliary muscle tries to overcome the error, when the eyes are focussed for near, as well as distant vision.

The eye is far-sighted from—

*First.*—Shortening of the optical axis, the eye being too short.

*Second.*—Flattening of the lens or cornea.

Far-sighted people are often characterized by narrow faces, shallow orbits, and eyes deep-set. The symptoms vary in this affection from none at all to severe ocular headache, and inability to read any length of time (in people under forty years) on account of the print blurring or running together. Glasses ordered oftentimes become indispensable, or may at first be used all the time, then later used only for near work.

The comfort of the patient is the fundamental reason for constant use of glasses, and also in very sensitive people, whose eyes give them much pain,—as semi-invalids, impressible and neuralgic patients,—while the dull, torpid, and unobservant will often be quite

indifferent to the aid of glasses, even though they have a marked error.

To correct this affection we order convex or plus glasses.

#### ASTIGMATISM.

This, as has been shown, is the error which causes four-fifths or more of ocular headaches. People in general have a very confused idea of astigmatism. It is an unequal curvature of the cornea or lens, or both. Instead of being spheres, they have a greater curvature in one direction than the other.

To use a rough illustration, we might say, the curvature of the cornea or lens in this affection is something like the outer surface of a spoon.

Now, in order to see clearly, the ciliary muscle has to contract irregularly, and in trying to accomplish this we get the eye-strain, which causes such a large number of severe and painful ocular headaches.

There are two kinds of astigmatism, regular and irregular. The latter is caused by disease of the cornea, and does not admit of satisfactory correction by glasses; the former, due to abnormal curvature of the cornea or lens, is corrected by cylindric or sphero-cylindric glasses.

Of correctable astigmatisms the greater number are congenital, and yet the error may not show itself during youth. A small amount of astigmatism is claimed to be natural to every one; but I cannot agree with such statements.

We have five forms of astigmatism, namely, far-sighted and compound far-sighted, near-sighted and compound near-sighted, together with mixed astigmatism.

In far-sighted astigmatism the defective axis is commonly the vertical, while in near-sighted it is the horizontal.

In mixed astigmatism one meridian is far-sighted and another is near-sighted.

The symptoms are severe ocular headaches, indistinct vision, according to the amount; also, in some cases, a person may notice a difference in the distinction of objects, as to their form.

In one case a patient could see the telegraph wire farther than he could see the pole on which it was stretched. Some patients cannot tell the time on a clock when the hands are in certain positions. College students have much trouble in distinctly seeing Greek, Hebrew, and German. Books are often held close to the eyes, and such patients are supposed to be near-sighted.

Want of quick perception is also a characteristic of this affection. Moreover, if the error be far- or near-sighted astigmatism, with the defective axis nearly horizontal in both cases, lines perpendicular are most distinctly seen. Persons with notable error get on moderately well, because most objects which we deal with have greater height than breadth. Such is the case with Roman type, trees, men (as a rule), buildings (especially in Chicago), statues, and the majority of objects. The height is often exaggerated, but the patient is not aware of this.

But if the axis is in the vertical or oblique direction, or the eyes are unsymmetrical, trouble announces itself early. An attack of illness, constant eye-work, excessive grief, etc., will reveal astigmatic errors which were previously unsuspected.

The more pronounced the head symptoms, the more searching must be the examination for any defects in sight, and if an error is found it should be immediately corrected by accurately-fitted glasses.

More glasses are worn now, not because people are not born with as good sight as they used to be years ago, but because the eyes are taxed more to-day than in the past.

Now, take your own profession, for instance. I think you will bear me out in the statement, that owing to the great advance in dentistry (especially operative), more time is required, and the eyes undergo a much greater strain in the details of the work than they did fifteen or twenty years ago.

This increased demand on our eyesight is seen also in all walks of life. Who would have supposed, twenty years ago, Sunday papers would ever print fifty to sixty pages or more, to be read on a day set apart for rest.

Another reason for glasses is because the eye has been more intelligently studied, and to-day many people are adopting glasses because they have proved their usefulness in the treatment of ocular headaches.

I will not go as far as the President of the Ophthalmic Section of the British Medical Association does, "who expresses the hope that the time will come when a man who goes about with his eyes naked will be so rare that the sight of him will almost raise a blush." But I will say that every person troubled with headache not traceable to some disturbance of the general system, who has not tried the use of appropriate glasses for relief, has neglected a most efficient cure furnished by optical therapeutics.

## A SIMPLE TEST FOR COCAINE IN LOCAL ANÆSTHETICS.<sup>1</sup>

BY MR. H. CARLTON SMITH, BOSTON.

MR. PRESIDENT AND GENTLEMEN OF THE AMERICAN ACADEMY OF DENTAL SCIENCE,—As my interest and attention have this winter been directed towards the study of your profession, it gives me unusual pleasure to be with you this evening and to have met so many of your number.

I have been asked to write a short paper for your meeting on cocaine, and, if possible, give some simple method for its detection which would be of practical value to busy dentists; a test which could be applied, without extended practice in chemical manipulations, to the various mixtures and preparations constantly brought to our notice by the circulars, type-written letters, and numerous other methods of modern advertising.

Some of these preparations, I believe, are worthy of consideration, and even of our confidence, while the use of many others is not to be thought of for a moment by the careful operator who would avoid all risk of serious ill by injecting into the blood such remedies as hydrochlorate of cocaine in solutions of unknown strength.

Cocaine has its uses, it may be, in certain combinations and in not too strong solutions, a very valuable agent for producing local anæsthesia by hypodermic injections, and many claim that the amount used of these preparations is so small that if they were cocaine solutions no harm could result; but I have here a circular issued by the Dickson Manufacturing Company, of Sharon, Pennsylvania, giving a list of twenty-one persons operated upon by Dr. H. F. Dickson, and the number of teeth extracted at a single sitting by the use of Dickson's anæsthetic. The number is in no case less than ten, and runs all the way to twenty-six. According to an analysis made by Professor S. P. Sadtler, of Philadelphia, Dickson's improved anæsthetic contains 3.9 per cent. anhydrous cocaine chlorate, besides chloral hydrate and carbolic acid. Now, if a preparation of this sort be injected on both sides of the tooth, as is usually directed, and repeated a sufficient number of times for the extraction of twenty-six teeth, it seems as though there might be some

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<sup>1</sup> Read before the American Academy of Dental Science, Boston, March 7, 1894.

question as to the wisdom of using a four-per-cent. solution of cocaine. This drug, as you are all aware, has an unenviable reputation for causing heart-failure, and many fatalities have resulted from its careless use; hence the necessity, or at least the desirability, of such a test as I have mentioned.

This subject was suggested several months since by Dr. William P. Cooke, and during the winter I have given considerable spare time to its consideration and investigation; and this paper will consist of a simple description of my experiments, leaving out a great deal that would be interesting regarding the discovery, history, and preparation of this undeniably wonderful compound.

A test suitable for your purpose I have never seen published nor heard given in any lecture on materia medica, toxicology, or medical chemistry. Cocaine does not give distinctive color reactions, as do many of the alkaloids. One of the most characteristic qualitative tests for its detection, as given by a prominent lecturer on toxicology, is to touch the suspected solution to the tip of the tongue. If numbness ensues, cocaine is probably present. This is a test obviously unsuited to our present purpose. The general alkaloidal reagents precipitate it; but this teaches us nothing, as the majority of alkaloids act in the same way, giving tests of similar appearance. Sulphuric, nitric, and hydrochloric acids, and ferric chloride all give negative results, and it is these reagents that give the distinguishing color tests for many common alkaloids.

A test has been recently published for cocaine, which consists of adding a drop of weak ferric chloride solution and heating the mixture to boiling. A blood-red color is developed, almost resembling ferric sulphocyanate. This color is accounted for by stating that when boiled with water cocaine decomposes, forming ecgonine, methyl alcohol, and benzoic acid. In the same journal this test is rather severely criticised by one who signs himself L. de K., by claiming that he found that the same color could be just as readily obtained by applying the test without cocaine.

Now, Mr. L. de K. is decidedly at fault. In an article in the *Berichter*, vol. xviii., page 2953, Merck states that he obtains cocaine from benzoylecgonine, so the theory of the above is all right; and, moreover, boiling a solution of ferric salt will not and cannot give a blood-red solution; although, if the solution be neutral in reaction, a brick-red precipitate of ferric hydrate will be formed, but the difference between a brick-red precipitate and a blood-red solution we need not waste time in discussing. Among other tests I tried this one, but did not succeed in obtaining satisfactory results until the



mixture had stood over night. While this is simple enough, I should feel a little uncertainty about it.

After many fruitless experiments it occurred to me that inasmuch as most alkaloids give reactions with iron salts, it would perhaps be possible to oxidize or reduce the iron in the presence of cocaine, and during the operation find some distinctive test for the alkaloid.

The following was tried. To a solution of cocaine was added a few drops of ferric chloride; the iron was reduced as usual; then a minute fragment of permanganate of potassium partially reoxidized the iron; and, lastly, the addition of a single drop of stannous chloride produced a white precipitate. This disappeared upon shaking, but one or two more drops of the chloride of tin reproduced it, and this time it was permanent. This practically constitutes my test.

Subsequent experiments proved that the use of the permanganate was unnecessary, and it was omitted. The tin salt was next tried alone, and then ferrous salt was used instead of the ferric, but in neither case were the tests so distinctive or satisfactory as when both salts were used in conjunction.

One-per-cent. solutions were then made up of each of the following, and carefully tested for cocaine by simply adding to two or three cubic centimetres of the solution three or four drops each of chloride of iron and chloride of tin. The one-per-cent. solutions were of cinchonidine, quinine, morphine, atropine, caffeine, strychnine, and some others of less frequent occurrence; and then, as usual ingredients of dental anæsthetics, chloral hydrate, carbolic acid, camphor, and menthol were used separately and in mixtures, and all with negative results save one,—viz., strychnine. This alkaloid also forms an insoluble salt with tin in presence of ferric chloride. This fact does not detract from the value of the test for dental use, for strychnine can be easily detected by evaporating a little of the solution to dryness and obtaining the fading purple color with sulphuric acid and bichromate of potash which is not obtained with cocaine; and then strychnine is the last thing which would ever be put into a preparation to produce local anæsthesia.

The character of the precipitate formed in the test is peculiar and worthy of notice. It very closely resembles the precipitate of chloride of silver, separating in curdy lumps not easily broken up by simple agitation of the test-tube. If you will allow me, I will show you what the precipitate looks like. In applying the test, dilute the solution with an equal bulk of water. This separates

camphor, menthol, or other substances soluble only in strong alcohol. If such a precipitate occurs it should be removed by filtration and the filtrate boiled to remove excess of alcohol.

1. Dorsenia.
2. Dorsenia without cocaine.
3. Solution of cocaine.

The precipitate is easily soluble in dilute oxalic or sulphurous acids.

I notice in the pamphlet advertising Dorsenia a paragraph which I should consider an emphatic warning against the use of cocaine. This seems to be a peculiar feature of these preparations, for, according to a clipping from the *American Druggist and Pharmaceutical Record* of October 12, 1893, Professor Sadtler has analyzed ten different samples of dental anæsthetics, and in nine found cocaine, as follows:

	Per cent.
Dixon's Improved . . . . .	3.90
Arophone . . . . .	1.46
Jeasop's . . . . .	2.63
Dorsenia . . . . .	0.20
Weinmann's . . . . .	5.68
Obtunder . . . . .	1.35
Dental Surprise . . . . .	1.46
Barr's . . . . .	None.
Eureka . . . . .	3.26
Anæsthetic Obtundent . . . . .	3.39

The percentages given are for anhydrous cocaine hydrochlorate.

The test we have been discussing to-night shows the cocaine in these preparations as far as I have been able to try them. I have also used it on the following samples received from Dr. Cooke: menthene, tonalgia, torpedus, and muraline. These all responded except the muraline, in which no change occurred. To be sure that no combination of other ingredients held the cocaine in solution and prevented its separation, I took equal portions of the muraline in separate test-tubes, and to one added a little one-per-cent. solution of cocaine, and to the other as much distilled water, and then by applying the test the cocaine in the first tube was detected without the least difficulty. There is no cocaine in muraline.

In using the test the following facts should be remembered. Strong alcohol will prevent the formation of the precipitate. So, while the official tincture of chloride of iron can be used, it should be diluted with about four times its bulk of water.

Cinchonidine and morphine can be made to give similar precipi-

tations, but *not* under the conditions of the test, as they require a large amount of stannous chloride solution.

Regarding the composition of the precipitate I have nothing to say, as no work has been done on this line.

The limited amount of time which I have been able to give to the subject has made it impossible to experiment with all of the compounds on the market, or with all the possible mixtures that might be made to serve the purpose of a local anæsthetic; but a great many have been tried, and thus far nothing has been found to interfere with or seriously impair the value of the test.

It is certainly safe to regard with strong suspicion any preparation giving the test for cocaine we have tried this evening.

Any more light on the subject, or suggestion of improvement, or possible error I shall be most happy to receive and investigate.

I thank you for your attention.

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## LATCH-LOCK, LEVER-CLASP, PLATES, AND BRIDGES.<sup>1</sup>

BY WM. S. DAVENPORT, D.D.S., PARIS, FRANCE.

FIGS. 1 and 2 illustrate two pieces of removable bridges, which are retained in position by means of *hinged levers as latches*.

FIG. 1.

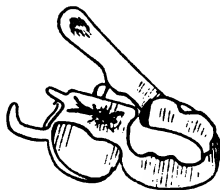
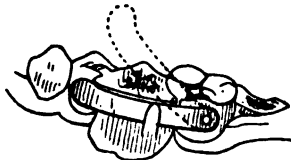


FIG. 2.



Number one has been in use for eight months and number two for five months, during which time they have given perfect satisfaction. It is needless to say, in the making of the same every detail must be accurately carried out. In each case an impression was taken of the molar to which the piece was to be attached. This was accurately secured by the use of plaster of Paris, which was broken from the tooth and the pieces reunited.

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<sup>1</sup> Read before the American Dental Club, of Paris, April 7, 1894.

Fusible metal was poured into the impression, giving an absolute fac-simile of the tooth. A platinum band was burnished around this die, so as to conform to the convexity of the crown of the tooth.

A small *platinum wire* was then bent around the band in place, at its largest circumference, and its ends twisted together; its position was marked, the wire was slipped off, the platinum band sprung off the metal tooth.

The wire was then replaced on the band, and the united band and wire, after being invested in sand and plaster, was covered to a desired thickness with Williams's clasp-metal, used as a solder, the whole making a tough and springy clasp.

The platinum wire not only preserves the form of the band, but acts as a guide for the even distribution of the clasp-metal over the surface of the platinum band; the thickness of the band being regulated by the size of the wire. This band was then cut open at the point near where the hinged lever was to be placed. A wire post was soldered to one end, to which the hinge was subsequently attached. An impression was taken on that side of the mouth with the band in position on the natural tooth, the porcelain facing, necessary clasps, and the lock-post were arranged on the model and waxed in position.

The piece was then removed, invested, and soldered as in ordinary bridge-work. The lever, consisting of a strong piece of clasp-metal, was riveted to the pin on the free end of the clasp, making the hinge, which, when brought behind the lock-post, acting as a fulcrum, and pressed down at the labial side of the bicuspid, not only tightens and locks the molar band, but clasps the piece firmly to the bicuspid.

Among the advantages of this method of clasping is the utilization of the corneux, bulbous portion of the teeth, where the enamel is the thickest; and by being so locked to the corneux surface it can neither move upward nor downward, but is easily removed by raising the lever.

COHESIVENESS OF TIN FILLINGS.<sup>1</sup>

BY DR. CHARLES E. FRANCIS, NEW YORK.

IN a paper which I read at the last meeting of this Society, I referred to tin as a valuable material for filling a certain class of cavities in teeth which my paper described, and also remarked that refined tin, or tin in a state of absolute purity, possessed a decided cohesive property. For making this statement, I was gently corrected by several friends present, who asserted that tin, or preparations of this metal, to which my paper referred, possessed no cohesive tendencies whatever. Although it was shown by specimens presented, in evidence of what I stated, that large contour fillings could be produced with pure tin-foil or tin shavings, which were so thoroughly condensed as to be firmly held together, and sufficiently compact as to receive smooth and brilliant surfaces, it was, nevertheless, declared by those who differed with me in opinion, that no actual union of the layers of this metal existed as they were forced against each other, but that they were held together simply by an intermingling of metal fibres produced by sharp points, or serrations.

In using the term "cohesion" on the occasion referred to, I presumed that I was correct in so doing; but as my nomenclature was questioned, I determined to look up authorities on the subject, with a view of either substantiating the correctness of my statement or admitting that I was in error.

My idea of cohesion (as before expressed) is the attractive force which holds or binds together the atoms, particles, or molecules of any homogeneous mass. In solids, it is the strength or integrity of the substance, and it matters not how or in what manner the atoms are blended.

Cohesion of metals may be effected by heat or pressure, according to the nature of the material. In the use of tin-foil, or shavings, where the layers are massed together to form a compact filling in a tooth, these layers are united or held together by the law of cohesion; and it matters not whether they adhere or stick together by slight pressure, like strips of damp court-plaster, or that their fibres are intermingled, interwrought, or blended together by means of serrated or wedge-shaped instruments. So long as the layers of foil are held together in such a manner as to resist any degree of tension, they are united by cohesive attraction; and it is not neces-

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<sup>1</sup> Read before the New York Odontological Society, April 17, 1894.

sary that the mass of metal should be absolutely *solid*, according to the general acceptation of this term, to define the attractive force as "cohesion;" for everybody is supposed to know that all substances which are denominated solids are but bodies of molecules held together by this force.

In regard to the tin fillings which I have produced, and some of which have been here exhibited, it is evident that the particles of metal are quite firmly united, and capable of resisting a considerable degree of strain. According to my idea of the term "cohesion," these particles, or layers, are bound or held together by this force; and I believe that I am supported in this view by popular authorities.

[Dr. Francis then quoted from various encyclopædias and popular text-books definitions of the term "cohesion;" also read several letters from prominent professional gentlemen to whom he had written for opinions concerning the cohesive properties of tin; then concluded by stating that if he was in error in denominating as "cohesive attraction" the force which holds together the atoms of tin in fillings of this material, that he was not alone in such opinion.]

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## Reports of Society Meetings.

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### NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, April 17, 1894, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, Dr. Brockway presiding.

The minutes of the previous meeting were read and approved.

#### INCIDENTS OF OFFICE PRACTICE AND CASUAL COMMUNICATIONS.

*The President.*—I notice many gentlemen present who are not members, and we extend to them a cordial invitation to take part in the discussions.

*Dr. S. E. Davenport.*—It pleases me to call attention to the fact that Dr. Lord has recently designed some very valuable instruments for removing tartar from the teeth. He has already presented these instruments to us, and has in private received the commendation of many gentlemen who have used them. I wish to add my thanks,

and say they are useful to me almost every day. Some little time ago I asked his permission to make some modification in the shape of the instruments, because I was unable, with the forms designed by him, and my methods of manipulation, to reach the roots of the molars satisfactorily. Dr. Lord's instrument-maker has made a number of instruments according to my suggestion, retaining the valuable feature of the Lord sickle-scaler,—the groove in both upper and lower edges. The modification which I suggested is merely a double curve, the instruments being rights and lefts, which enables me to operate upon the molars without stretching the lips of the patient very much; and I will pass around several pairs for examination.

*Dr. Lord.*—No one need to feel that they must ask permission to change the curves or angles of the instruments; of course, every one would prefer to suggest his own curves. The groove in the edges of the hook or curve of the instrument is the only feature in which it differs from the old (so-called) sickle instrument.

*Dr. Littig.*—I desire to speak of the way in which I utilize old amalgam. I take the scraps, melt them up, and pour into an ingot, which, of course, drives off all the mercury. We frequently want the form of a tooth to make a band or clasp upon, that will be stronger than plaster; and when I have taken my impression, and I realize that I want such a tooth in metal, I simply mix up this old amalgam which I have filed up, and pack it into my impression, making the cast of a small tooth, on which I can make my band or clasp. You may ask, "Why don't you use Melotte's fusible metal?" but we do not always have it at hand, and I can use this with wax or any impression material. I file it up after I have melted it, with a coarse rasp. I have with me some of the teeth that I have already made.

*Dr. Jackson.*—I have here a model, with an appliance for retaining loose teeth, which I brought this evening on account of some remarks that were made at the February meeting regarding methods of holding incisors that had become loose from pyorrhœa or other cause. I would like to present the apparatus, although I propose at some future time to describe it more fully.

Dr. Pain suggested a method of anchoring a gold bar to the cuspid teeth which passed on the lingual side of the incisors, from which gold fingers extended forward to clasp the loose teeth.

I have constructed a crib appliance for holding a tooth that had fallen out from pyorrhœa, and I could see from Dr. Pain's remarks that the same style apparatus could be readily used for retaining

loose teeth. The appliance is made of German silver, although gold or platinum-iridium can be utilized with equal advantage.

A small wire bar is passed on the lingual side of the teeth, near the gum, and anchored, with crib attachments, to a bicuspid on each side. Wires are arranged at the junction of the teeth to be retained. They should be soldered to the bar and extend to the cutting-edge of the incisors, where they should pass over to the labial side, which forms a hook. It may be necessary, in some cases, to grind the upper side of the wire flat, and cut a slight notch, so that the wire shall rest level with the cutting-edge; or the inner part of the hook portion of the wire can be flattened and the notches between the teeth made to correspond.

*Dr. Francis.*—I would like to ask a question in regard to oxyphosphate of zinc. From the experience of the gentlemen present, which do they prefer? I formerly thought Weston's was pretty good, but in the last year I think it has failed very much.

*The President.*—I hope the gentlemen will answer that question satisfactorily. I do not know of any one who is entirely satisfied with the preparation of oxyphosphate of zinc that he is using. If there is any one present who can answer that, I hope he will do so.

*Dr. Lord.*—I have used Hammond's oxyphosphate with the most satisfaction. The liquid does not crystallize. It maintains its clearness to the end of the bottle, and apparently is as good as when first opened.

*Dr. Bogue.*—What about its durability?

*Dr. Lord.*—I have only used it about a year, but, as far as I have noticed it, it wears well.

*Dr. Bogue.*—I have a lot in the mouth that is six or seven years old. It is Poulson's. It can be mixed so it will wear away in six months, or it can be made sometimes to last six years. All I know about it I learned from Dr. Arthur. He told me not to use oxyphosphate that had a liquid, but to use such preparations as require the melting of the crystals of the phosphoric acid at the time of using. He recommended this one of Poulson's, and I will tell you how I use it. Lay your powder out on a cold slab, or glass. Please put emphasis on the "cold," as I have had gentlemen tell me to warm it slightly. I keep my glass in the refrigerator. The oxide of zinc is put on the glass; the phosphoric acid is melted on a bit of platinum over the spirit-lamp, at so low a degree that I hold the platinum in my fingers. It is kept over the flame until it is thoroughly melted, and is then immediately poured upon the glass. Of course, it becomes chilled at once. My instruments are ready,



the rubber dam is on, and a cushion of chamois-skin, slightly oiled, is ready and fixed to my table. Before I begin to mix, all these things are prepared. I mix it as stiff as it can be made. I take it off the glass and knead it with my fingers on my way to the cavity, and when I get there it has softened a second time. Then it is packed in as rapidly as possible, sometimes with a matrix, sometimes not. It is as stiff as hard putty to begin with, and when I am through it is very stiff. When it has become hard, it is whittled down with a tiny sickle-shaped lancet, and when finally polished down with fine tapes,—polished slowly, so as not to heat it,—then it is dried off with a current of air, and stearine or paraffine is melted on the surface. I have some fillings that have been in a long time. One is in the mouth of my daughter. It was to stay there temporarily, but it has now been in over six years, and has not deteriorated. I am pleased to bring this Poulson's material again before my brethren. It takes a little more time and a great deal more care. One wants to know the preparation before he begins to put it in the mouth, lest it set too quickly; but when you are careful the best results can be had with it that I have been able to get from any of the phosphate cements.

*The President.*—What is the object of the oiled chamois-skin?

*Dr. Bogue.*—To run my burnisher quickly over this pad, so it does not stick to the phosphate as I am packing it in.

*The President.*—Are you particular to mix it slowly?

*Dr. Bogue.*—No; I add it as quickly as I can thoroughly.

*The President.*—Is that not contrary to the usual advice in the directions which come with the phosphates?

*Dr. Bogue.*—That I do not know. I have not read the directions for some time. Of course, you cannot mix thoroughly and mix with very great rapidity.

*Dr. Ives.*—I never saw but one oxyphosphate filling that was really successful. It was made with Fletcher's, I believe, and the fluid was very opaque. It was a large corono-approximal cavity in a lower molar. It had been in for fifteen years, and I could not see the least possible waste in any shape or manner.

*The President.*—That is one of the most favorable places for an oxyphosphate filling, I believe.

*Dr. Ives.*—Yes, it is.

*Dr. Bogue.*—And yet Fletcher, in Ash's Catalogue, in response to the offer, I think, of one hundred pounds on the part of the British Odontological Society for experiments to be made in that direction, indulges in some merriment at the expense of the Society, saying

he had spent at least fifteen thousand pounds, and knew there was a fortune in store for any one who could discover such an oxyphosphate.

*Dr. Davenport.*—Regarding the durability of Poulson's zinc phosphate in the mouth, I have known the material, with the greatest possible care in insertion, and with all conditions as favorable as described by Dr. Bogue, to fail as quickly in certain mouths as any zinc phosphate one could select with failure in view; but I think such cases are exceptional, and that it is really the most reliable of our cements. I have used very satisfactorily, as I presume all have in approximal cavities, gutta-percha at the cervical wall and for perhaps one-quarter the depth of the cavity, preferably with the matrix, completing the filling with Poulson's or other phosphates. It seems to me that if we do fill approximal cavities with zinc phosphate, the gutta-percha at the gum margin will certainly add to the durability of the filling.

*Dr. Stockton.*—My experience is very much like that of the other gentlemen present. As Dr. Davenport has just said, sometimes one cement does well and at other times it does badly. I think I have used them all.

I used, at one time, Dr. Welch's oxyphosphate, and thought of that when the doctor spoke of the filling which had been in such a long time. One filling, I remember, lasted about seven years. The same material used in many other cases failed. There is a great difference in this material; some hardens at once and others take a long time. I find that Britton's cement, manufactured in Trenton, New Jersey, is quite a good one. I have used it lately. In almost all approximal cases, as Dr. Davenport has said, I never trust the oxyphosphate without placing in gutta-percha at the cervical wall. I might say that gutta-percha does even better than oxyphosphate in many cases. I often wonder that we succeed as well as we do with the materials we have.

*Dr. Bogue.*—Is it ever proper to destroy the pulp in the treatment of calcic abscess? If so, why? If not, why not?

It has been generally supposed that dental caries occurs either in the enamel (white decay), or in the dentine after the enamel has been penetrated, but that practically it never occurs in the cementum.

I present this evening a typical case,—one of perhaps a dozen or more that have come into my hands within the past four or five years,—where the decay is distinctly in the cementum, and has been progressing so long that the pulp became exposed.

The position of the cavity is so unusual that it seems to have

escaped the notice of three different dentists, all of whom have treated the case differently, and now that it has come into the hands of a fourth practitioner, a course has been adopted quite at variance with any of the usual ones.

The conditions were as follows: The patient, a clergyman of over fifty years of age; the three right superior molars all loose, all extremely sensitive to heat and cold, growing worse week by week until the effort to masticate is so painful that mastication is given up on that side. Then the brush becomes a source of pain, and is used with "great care." (I quote the words of the patient, which I interpret to mean "great care" not to hurt himself, but not great care to keep the tartar off.) After some weeks (eight or ten) of suffering, no relief being found, the second molar was extracted, as an abscess had begun to form at its root. This loss interfered with vocalization, making it difficult to pronounce certain words, and wearisome in case of long-continued speaking. The sensitiveness of the other two teeth continued unabated, and they seemed to be getting continually looser.

At this period he came into my hands.

After getting the history of the case and making an examination, I diagnosed as follows:

*First.*—Calcic abscesses on all three of the teeth, owing to the deposition of tartar and the consequent recession of the gums.

*Second.*—The probable death of the pulp of the second molar from that recession, causing the abscess which precipitated its loss.

*Third.*—The certainty that the pulp of the wisdom-tooth would speedily follow in the course of that of the second molar, and die spontaneously.

*Fourth.*—That the pulp of the first molar was causing pain from a slight exposure through the cavity of decay in the cementum.

*Treatment.*—With a fine sharp drill I opened at once into the pulp-chamber of both first and third molars, and applied arsenic.

At this point I interrupt my written paper to allow an opportunity for discussion, questioning, and criticism, which must necessarily arise when so many of us are considering the same case.

*Dr. Davenport.*—Many years ago I gave up having any respect for the pulp in a tooth which was so uncomfortable that it could not be brushed or used in mastication. It seems to me that it would have been impossible for Dr. Bogue to adopt any other course than to destroy the life and, consequently, the extreme sensitiveness, of teeth in the condition described, his duty being to give the patient comfort and the use of the teeth.

*Dr. Ives.*—What else could he possibly do, the pulp being exposed, than to destroy it?

*Dr. Bogue.*—The pulp in the wisdom-tooth was not exposed, although the first-molar pulp was. This is not the first time I have destroyed the pulp because the patient was urging me to extract the tooth. One lady complained that it gave her so much pain she thought the tooth was worth less than her comfort. I did destroy the pulp, and I think the tooth is there yet, after some eighteen years. On several occasions, notwithstanding the injunction that we are not to do so, I have destroyed the pulp with a view of keeping the tooth longer in the mouth. I certainly supposed this treatment would be attacked. I should be glad to have it done, because after the attacking party has ventilated its ideas, and I mine, we might get at the facts.

*Dr. Nash.*—I have a case somewhat in point. A gentleman of the dental profession called upon me one Sunday morning, in great pain, having a lower molar with a large open cavity, but no pulp exposure. I applied some creosote and oil of cloves in the cavity thinking it might afford relief, and in the course of two or three hours he came back. The pain was intolerable, and I resorted to heroic measures by taking up the engine-drill and deliberately exposing the pulp, liberating congested blood; I then applied my creosote and oil of cloves with some satisfaction. He said he was relieved from that moment. Several days afterwards I made an application of arsenic. He had intense pain that night, but since then he has been free from any discomfort; and as soon as opportunity offers, I shall proceed in the usual manner to fill the tooth permanently.

*Dr. Brewster.*—May I ask Dr. Bogue, how long after the extraction of the second molar was the impression taken?

*Dr. Bogue.*—I do not know; about two or three weeks. I did not see the patient until after the second molar had been extracted.

*Dr. Brewster.*—Then there was not much inflammation at the time it came to you?

*Dr. Bogue.*—No. I would say now that the patient came back and reported that during twenty-four or forty-eight hours he suffered considerable pain from the application I made in the cavity in the first molar. Be it understood that the arsenic I put in was intermingled with the cotton preparation, so that it was seemingly dry. I packed it into that root canal so as to be sure that nothing touched the gum. I drilled into the wisdom-tooth right through the anterior face, and packed the arsenicated cotton in there. He suffered twenty-four hours with that first molar, and after forty-

eight hours he went to his regular dentist at home (another city than New York), and that gentleman removed the arsenic from the first molar, but did not touch the wisdom-tooth. The pain in the wisdom-tooth ceased on the second day, and he said he had been perfectly comfortable since, and the tooth had become firm in its socket. The pain in the first molar was continuing, and the tooth was looser than ever. I drilled in and removed what pulp I could from the first molar, and treated it with vinaigre de Pennés, which is a preparation made of benzoic acid, boracic acid, benzoin, carbolic acid, and various other things of that sort. I have most of the ingredients, but not all. It is a proprietary medicine in France. Its antiseptic qualities are such that, about four months ago, I threw a few drops upon a piece of beefsteak that was not very fresh, and another piece that was fresh, and I have kept them in my office ever since. Its use has been vaunted in a curious way, namely, by using it after the application of arsenic, and without the extraction of the pulp in wisdom-teeth, especially where pain has been present from exposure or partial exposure. The cavities are then supposed to be filled up with anything you like, and the patient never afterwards complains.

*A Member.*—Is not that something like the Herbst method?

*Dr. Bogue.*—Herbst's method is conceived without knowledge of the conditions involved. Herbst is a good mechanic, but not a physician nor an anatomist, still less a pathologist, as I understand it. The other man is. In this case, the third molar was rendered comfortable. The gentleman can brush his tooth again. The first molar has its posterior buccal root denuded of periosteum to the apex, the palatine root half-way, and the anterior buccal pretty well up. In these cases, after the arsenic has done its work, the tartar may be removed, the patient may again eat on that tooth, and the tooth may be restored to fairly good condition. I have seen them remain for years, when the patient had begged to have them extracted previously to that application.

Before I sit down I want to present before the Society two teeth which one of our members has just handed me. One of them seems to completely upset what I stated here a month ago. Here is a tin-foil bottom to a gold filling. The amount of tin in proportion to the gold is very small, but the mixed filling has been there eight years. So reads the label. So far as I can see, it is in pretty good order. I will take it home and make a more careful examination. If it is in good condition, it is the first one I have seen. As has been stated, there is a great difference between putting gold among tin

and putting tin among gold. It seems as though this were a case in which the tin had lasted.

Here is a case that the doctor was kind enough to show, much like the cases that I have been describing, in which a tooth with a living root has had tartar secretions clear up to the other root. It was extremely sensitive to heat and cold. The posterior root was evidently devitalized.

Dr. Francis then read a paper on the subject of cohesiveness of tin fillings. Dr. Francis also read a short editorial by Dr. Barrett, of Buffalo, entitled "The Virtues of Tin," in the *Dental Practitioner*. (For Dr. Francis's paper, see page 443.)

#### DISCUSSION.

*Dr. Ives.*—If I remember rightly, in Dr. Francis's first paper, no one took issue with him that tin was not cohesive. As far as my remarks were concerned, I said that it was not cohesive in the same sense that gold was; that it was what we call mechanical cohesion,—that you could not lay two pieces of tin together and get the same results as when you lay together two pieces of gold. All these gentlemen claim that the surfaces must be fresh and perfectly pure. Thinking of the paper after the last meeting, I made a cavity in a natural tooth, and with one single instrument, and hand-pressure entirely, I built out a contour filling. I have it here with me. The last three layers I dipped in water, and, under the same kind of pressure, they stayed there. What I meant in my remarks at the last meeting was that tin-foil could not be used in the same sense that gold-foil was used, and that I had never seen it done. The foil in this filling has been lying in my drawer for eight or ten years. It was mechanical cohesion in every sense of the word.

*Dr. Lord.*—I do not think that any one at the last meeting said that tin was not cohesive in some sense.

When Dr. Francis used the word cohesive as applied to tin, I said Dr. Francis certainly does not mean that tin is cohesive in the sense that cohesive gold is cohesive, or as we use the term in speaking of cohesive gold. That was all that I said in regard to the cohesiveness of tin, just then. Later, I said in my little paper that it was mechanical cohesion, as I understand it. The folds or layers are forced into each other with suitable points, and in that way we get cohesion, and in the same way we get cohesion of soft gold, and so get a solid mass. The tin being softer, it can be made the more solid of the two, but the gold will wear the longest when exposed to or in a masticating surface, as it is a harder metal.

*Dr. Nash.*—I would suggest that one of these contour fillings that have been made in the teeth out of the mouth be taken from the cavity, so as to see exactly the form of cohesion that has taken place there. I have experimented, since hearing Dr. Francis read his paper, to a limited extent only, with some of Mr. Kearsing's tin, and I succeeded in making a contour filling and getting a good hard surface. I afterwards removed that filling, and concluded that the cohesive properties of tin are not such as we expect in using gold.

*Dr. Lord.*—I think it is a mistake to say that the tin must be fresh, or freshly made, to work well. I am using tin that was made, as I stated at the last meeting, over twenty years ago. It is just as bright, can be packed as solid, and works in every way as well as when it was first made. I notice no difference, as I stated at that time.

*Dr. Bogue.*—Dr. Ives, I believe, is willing to take out that tin filling, and show us what cohesion has taken place. It seems to me that we are a little at variance, because, possibly, we do not all understand in the same way. Suppose I take a quart of plaster and mix it with water and let it set, I have a fairly solid mass; but if I mix with that plaster a quart of sand, while I have a solid mass I have not the same kind of solidity. My friend, Dr. Lord, may say that his old tin-foil works just as well as fresh foil. I grant that it does, so far as the sensitiveness of our fingers can guide us; but if we were to examine them, we would find in the old foil filling atoms that had been oxidized. It could not be otherwise. Put the foil where you please, and there will be oxidation on the surface of the tin, while there would not be on gold.

*Dr. Stockton.*—I do not think it matters much whether tin is cohesive or not. I have no doubt that it is. All metals are more or less so. What we want to know is, Is tin better than other materials, or as good, for filling teeth? We don't care so much about cohesion as whether tin saves teeth or not. For approximal cavities, and for filling the cervical walls, where you will finish with gold, I say it is one of the best materials that can be used. We do not care to bother about cohesion, because it would take three or four times as long to fill a tooth by that process as it would by the English or Scotch process of "stuffing," as they call it. You can fill a tooth three or four times quicker by the wedging process than you can by cohesion. Use tin just as you do soft gold-foil. I remember Dr. Darby, at the Columbian Congress, spoke on the subject, and has since written upon it, and I suppose everybody now will take up tin. We had copper amalgam some time ago, and we

all wish we had never used it; but we won't wish that about tin, because it has stood the test. It is very useful in children's teeth especially. Not very many years ago we discussed the good qualities of tin at societies all over the country, and it has come back again. I think the conservative practice is to use tin where we think it best, gold where that is best, gutta-percha and oxyphosphate where we consider they are the best. They all have their uses.

*Dr. Bogue.*—Some months ago I brought before this Society a photograph, which you possibly may remember. It was that of a young girl, twenty-one years of age, a good portion of whose jaw was amputated, and a substitute was screwed on to the two ends of the bone by Dr. Michaels, of Paris. Since then, under the direction of Dr. Péon, he has performed another operation, which is to construct the shoulder-joint of the left shoulder of rubber and platinum, and screw that fast to the humerus below and the scapula above. I have with me pictures of the apparatus in place, one with the arm open, one of the apparatus in place again in a different position, and one of the young man himself.

I saw him some time after the operation, and saw him use his arm, which he did a little awkwardly. He said he could use his fork, but not easily. A similar thing has been performed in Lyons, and Dr. Abbé, on Forty-ninth Street, New York City, has inserted a glass tube into the artery of a dog and trotted him out, still alive and pretty well. The day before yesterday, I saw the Paris edition of the New York *Herald*, containing this young man's portrait and two of the photographs that I have shown you, with a description of the apparatus. As it was done by one of our own specialty, Dr. Michaels, I take great pleasure in bringing it before the Society. It seems to me that to him a great deal of credit is due for a marvellous operation. His invention of the shoulder-joint is clear cut. It was a very simple affair, resembling almost a ball-and-socket joint; only the ball, instead of being in the socket in this way [illustrating], has platinum around the outside, so it moves in both directions.

*Dr. Littig.*—How long ago was that operation performed?

*Dr. Bogue.*—A year ago, and the patient's condition has since improved in every way.

Adjourned.

JOHN I. HART, D.D.S.,  
*Editor New York Odontological Society.*



## AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, on Wednesday evening, March 7, at six o'clock, President Smith in the chair. Papers for the evening were read as follows:

Charles F. Stacey, M.D.: subject, "Ocular Headaches." Mr. H. Carlton Smith: subject, "A Simple Test for Cocaine in Local Anæsthetics."

(For Dr. Stacey's paper, see page 431.)

### DISCUSSION.

*Dr. Hitchcock.*—I would like to ask Dr. Stacey what is the greatest variation in the lens?

*Dr. Stacey.*—The variation in the lens as regards sight is generally quite small. Where there is considerable variation, it is usually present both in the lens and the cornea. If large errors exist, oftentimes the lens is absent and the trouble is congenital, the patient being born without any lens at all. Then, of course, you have to replace the lens by a glass in front of the eye. That is what happens in the operation known as the "removal of a cataract," which means, in fact, the removal of the lens; and then you supply a lens by a strong glass in front of the eye.

*Dr. Hitchcock.*—I meant more especially the linear measure of the variation. Individuals differ in the convexity of the lens. In taking a relative linear measure, what is the greatest difference?

*Dr. Stacey.*—I cannot give you just that fact.

*Dr. Hitchcock.*—Suppose there are two people having lenses of a given convexity, would the sight be the same in both persons?

*Dr. Stacey.*—Oh, yes. Take the normal eye, for instance: the power of sight is always the same. A great many observers claim that there is no normal eye; that there is a certain amount of astigmatism in every individual; but cases have been reported where normal eyes were present, and I think I have seen one or two instances of it myself, although it is a rare thing. Where the curvature and convexity are the same, the sight should be the same.

*Dr. Hitchcock.*—I was thinking that what might be normal in one individual would be abnormal in another.

*Dr. Stacey.*—That is possible, but I should say not very probable.

*Dr. Hitchcock.*—I know that with my own eyes one of them is far-sighted and the other is supposed to be about normal, and the far-sighted eye was somewhat strained in trying to keep up to the normal eye, and yet the linear measure of the lens is very nearly the same.

*Dr. Stacey.*—That is very likely.

*Dr. H. A. Baker.*—I would like to ask Dr. Stacey if in case a person has astigmatism, and that is corrected by glasses and ocular headaches prevented, whether that fact proves that you have the correct glasses?

*Dr. Stacey.*—No; I don't think it does. Oftentimes you will put a glass onto a patient, and it will relieve the headache. In a year or more that patient returns, complaining of some trouble of the eyes, and you examine them and find that the glass is not just what it should be; and as a year's time should not make much difference in the power of the eye, it proves that you did not get the correct error when you first examined. You know in the examination of the eye we are obliged to effect a paralysis by putting in atropia, and there are some people who object to that; they won't let you put anything in their eyes at all, and consequently you are obliged to fit the glasses without atropinization. In this way you do not get the full error, and when the person returns the only thing to do is to atropinize the eye to get at the full error. Those persons may not suffer with headache, because a partial correction of the error will oftentimes relieve the headache; but they may have some other trouble which is a distinct symptom of impaired sight.

*President Smith.*—Is there any danger in using atropia in the eye?

*Dr. Stacey.*—There is very little danger in using such solutions of atropia as are ordinarily used. The strength of the solution most often used is two per cent., but in severe cases we sometimes use a four-per-cent. solution, and that is as strong as is ever put in the eye. The drug mostly used nowadays is called "homatropine," which is a somewhat modified preparation of atropine, and with that the paralysis generally lasts only twenty-four to forty-eight hours. I never heard of but one or two cases where it exceeded that length of time. In one case the paralysis lasted for four days, but the patient was a very nervous person, and it was thought that this result was owing to the neurasthenic condition of the patient.

*Dr. Eames.*—I would like a little fuller explanation in regard to the character of ocular headaches. Are they continuous head-

aches, or are they likely to be periodical, or brought on by some indisposition?

*Dr. Stacey.*—The headaches may be periodical, or they may be constant; and when the error in the eyes is far-sighted astigmatism the trouble is increased when the eyes are focussed for near work; whereas, in near-sighted astigmatism the pain is increased by focussing the eyes at a distance. In the latter cases headaches are brought on by attending the theatre or a concert, or going out walking and taking vision at a parallel range; while oftentimes for near work the person is not affected at all, and gets along very comfortably with ordinary duties.

*Dr. Eames.*—I suppose that after a night's rest, and the eyes being refreshed, the patient would get relief from the headache, and the unpleasant symptoms would return with the use of the eyes?

*Dr. Stacey.*—Rest might relieve them to a certain extent, but the headache would return with the use of the eyes.

*Dr. Bradley.*—Some one asked regarding the effects of an indisposition. I would like to ask whether indigestion or a derangement of the functions of the stomach would affect the eyes?

*Dr. Stacey.*—As a rule, anything like that would tend to aggravate the trouble.

*Dr. Paine.*—Will Dr. Stacey please tell us if a trouble of the eye would cause indigestion?

*Dr. Stacey.*—Well, that opens up another factor. Some men have gone so far as to claim that almost all neurasthenic diseases can be traced to the eye. Dr. Stevens, of New York, who is a great eye-man, seems to hold this opinion. Epilepsy has been proved to have been caused by straining the eyes; nausea and vomiting have been produced by eye-strain; and it is a well-believed fact now that in a great many cases St. Vitus's Dance, or Chorea, is caused by eye-strain. Headaches, neurasthenic diseases, and in some cases stomach trouble, such as vomiting and vertigo, are what you might call occasional symptoms of an error in the refraction of the eyes.

*Dr. G. S. Baker.*—I would like to ask whether an abnormal condition of the eye is more common in females than in males?

*Dr. Stacey.*—I never happened to see any statistics in that respect, but I should say from what I have seen and what I have read that the abnormal condition is nearly equally distributed among the male and female.

*President Smith.*—If there are no further remarks to be made

on this subject, we will pass to the next subject of the evening. I have the pleasure of introducing to you Mr. H. Carlton Smith. Mr. Smith will read a paper entitled "A Simple Test for Cocaine in Local Anæsthetics."

(For Mr. Smith's paper, see page 437.)

#### DISCUSSION.

*Dr. Hitchcock.*—I would like to ask Mr. Smith if he is entirely opposed to cocaine?

*Mr. Smith.*—No; I don't mean to give that impression. It may be a very valuable remedy to use if you know the strength of the solution you are using. I should oppose the use of cocaine in preparations that you know nothing whatever about. For instance, in one of the solutions that I examined, as I have told you here this evening, I found nearly four per cent. of cocaine. I should think it unwise to use such a preparation.

*Dr. Hitchcock.*—In speaking of "Dorsenia," you said you found one-fifth of one per cent., which is one in five hundred. There are four hundred and eighty minims in an ounce. If you use twenty minims for an injection, is not that perfectly safe?

*Mr. Smith.*—So far as the cocaine goes, that would be perfectly safe. In talking with one of your members before supper, he told me of a case where serious results followed the use of "Dorsenia." I should not expect serious effects from the cocaine there is in it, as it is such a slight amount. What else it may contain which would produce such results I do not know, as I simply tested for cocaine.

*Dr. Cooke.*—This "Dorsenia" which Mr. Smith had to-night is some which the proprietor and discoverer of the remedy gave me two or three years ago. I never used it, but kept it in my cabinet, and when I spoke to Mr. Smith, some time ago, about this matter, I handed it to him, and he analyzed it with the result which he has told you to-night. "Torpidus" Hood & Reynolds sell, and I was assured that there was only a small percentage of cocaine in it,—not enough to do any harm. "Muraline" B. L. Knapp & Co. keep, and I believe it is simply used to put in the pockets in pyorrhœa.

This is a subject that I am glad to have opened, as I never dared inject any of these substances under the gum. One year ago I decided to put aside everything that came to me in the shape of circulars or advertisements of anæsthetics; and I looked into the drawer the other day and found I had about twenty-five or thirty, a large share of the substances being used to inject under the gum for the extraction of teeth without pain; and as all these prepara-

tions have come since the discovery of cocaine, I suspect that cocaine is at the bottom of the whole of them.

*Dr. Potter.*—I am very glad that we are getting onto this line of work; it is just what we need to do. I cannot conceive how any one in our profession can use a secret remedy. If anything unfavorable should happen and the practitioner were brought up before the law, it would not help him at all to state that a certain manufacturing company said that the preparation used was entirely harmless. The practitioner must himself know the exact nature of the drug and its strength. There are too many in our profession who are using whatever the manufacturing chemists send to them. I think cocaine is a very valuable remedy, but when we use it we ought to know just what amount we have got under our thumb in the syringe, and so use a medicinal dose and not a dangerous one.

*Dr. Briggs.*—I would like to follow right on here and add that it seems to me the danger is not so much in the dentist's use of cocaine as in using one of these nostrums and supposing that he is not using cocaine, and in many cases probably entirely unprepared to treat the case should he have untoward results. There is where the greatest danger lies. Of the men who use those nostrums there is perhaps not one in one hundred who would know what to do in case of cocaine-poisoning, or has the means at hand to resuscitate the patient. Of course, where the doses run up high the danger is increased; but still, if a patient has an idiosyncrasy which prohibits the use of cocaine or other alkaloids, I have found that the smallest dose may give rise to dangerous symptoms; and the question is, "Is the dentist prepared to treat patients for cocaine-poisoning?"

*President Smith.*—Perhaps it would be well for Dr. Briggs to state what preparation is needed.

*Dr. Briggs.*—That is entering on another subject. I make it a point to always have on hand the heart-stimulants, the usual restoratives for heart-failure, with the particular addition of always keeping capsules of nitrite of amyl, which seems to be specially useful in cases of cocaine-poisoning. In administering the drug, whenever I have seen any signs of absorption I have given ammonia by inhalation and by the stomach, and in one or two cases subcutaneous injections of brandy or ether. These are standard remedies which every dentist ought to have for treatment of cases of heart-failure, which may come from the shock of an operation as well as from cocaine- or ether-poisoning. And if he has a fatal termination after using the best-known antidotes, his conscience will not prick him as if he actually administered poison without anything at hand for the

resuscitation of the patient. This is where the danger comes in in using nostrums that are said to be harmless, but of whose composition the dentist is ignorant.

*Dr. Werner.*—The essayist spoke of a case where twenty teeth were extracted with the use of one of these preparations. Can he tell us how many subcutaneous injections were made? Would it require more for twenty-six than it would for one?

*Mr. Smith.*—Probably an intermediate number. You know, of course, how far the gum is anesthetized by its whitened appearance, and, as it is injected on both sides of the tooth, it is hardly probable that for twenty-six teeth it would be necessary to make fifty-two injections, because one injection would probably cause numbness of the gum for some little distance beyond each tooth.

*Dr. Werner.*—Would it not seem by that that, even with "Dor-senia," where there is only two-tenths of one per cent. cocaine, it would become dangerous with twenty-six injections, or any considerable number? It seems to me the pain from the injection would be an infliction almost as bad as the extraction of the tooth.

*Mr. Smith.*—They direct the use of a very fine hypodermic needle, —the finer the needle the less pain,—and experience teaches one how to make the injection without much discomfort to the patient.

*Dr. Cooke.*—I would like to know whether any one can say whether the place in the body where the cocaine is injected would make any difference; whether, if in the region of the fifth nerve where we have to operate, it is more dangerous than it would be in other parts of the body.

*Dr. Werner.*—Of course it must. Any operation on the fifth nerve, which is in such direct sympathy with the vagus nerve,—the nerve controlling the action of the heart,—must be attended with considerable shock, or even danger.

*Dr. Brackett.*—I wish first to express my appreciation of our present Executive Committee and the evidence of the profitable work that they put before us month after month, and after that, of the specialists who have each given us the fruits and statements of positive knowledge in certain directions outside of the range of our own theorizing, our own study, or our own practice. Further than that, I wish to testify to the very great aid cocaine solutions have been to me in my practice from the time cocaine was first to be had up to the present. In saying this I do not mean that cocaine is by any means a sole reliance; but I do mean to say that it is to me one of various valuable resources. In my practice I see all classes of people, and in my humble way try to perform all kinds of operations

ordinarily required of the dentist, and I should not wish to be deprived of the use of cocaine and the hypodermic syringe; I should desire not to be prevented from using nitrous oxide; I should not want to be debarred from using ether, and I should object to being prohibited from using chloroform. I find cases coming to me at short intervals in which one or another of these agents, in my judgment, educated by my experience, is better adapted than either one of the others; and, of course, I also have other cases where nothing whatever of the sort would be suitable. I think here is an illustration of the way in which humanity shows its lack of consideration, expecting everything from one agent, believing too narrowly in one doctrine or one statement, one truth or one aspect of truth. I believe that homœopathy has an element of truth in it, and so, too, have hydropathy and allopathy. I believe there is something that is true in Spiritualism; that there is also truth in the faith cure, and in the influence of mind over matter. The thing that I complain about, that I think the human mind does not generally exercise itself most profitably concerning, is that it praises a thing or condemns a thing indiscriminately, completely, and universally.

I believe that in cocaine we have an agent that has its legitimate place, and if carefully used we may expect definite, most helpful and beneficial results. In operations where we are likely to have hurts to soft tissues, such as the common application of the rubber dam where a cavity of decay has gone considerably under the gum, in the fitting of bands to roots, and wherever soft tissue in appropriate states would otherwise be hurt, cocaine is a most helpful agent; always provided, however, that it is used within the limits of safety. This is the testimony that I would give out of years of experience,—that cocaine and the hypodermic syringe have their place in the performance of dental operations, and that the dentist who does not have cocaine, or the means of making cocaine solutions, at hand is not giving himself and his patients all the comforts that they may have. That is my view of the subject; and in defending the use of cocaine I mean to be understood that this is one resource; that its use should be governed by intelligence and discrimination, and should be associated with care in the first use of the agent for a particular patient. I have found great differences in the susceptibility of patients to its influence, and until I have made myself reasonably sure of the tolerability of the drug by the patient, I seek to err on the safe side. There are a very few of my patients for whom I do not attempt to use it, and others' tolerability of the drug seems to be practically unlimited. I find

that it is especially applicable in the extraction of roots, in the removal of epulis and similar tumors, and where I particularly wish to avoid haste. If I can get through very quickly the extraction of a firmly-set tooth, I may decidedly prefer nitrous oxide; but in cases where it is necessary to feel about for roots overgrown in the gum, and not requiring much strength for their extraction after they are located, nitrous oxide would be unsuited, and I find the cocaine solutions decidedly appropriate.

While I have not been so accurate about the percentage of cocaine in solutions that I employ, I have sought to have knowledge of the sum total of what I was using. Until I have proved that the patient has an especially good degree of toleration, I plan to be sure that the amount of solution which I inject for one operation represents less than the quarter of a grain of the hydrochlorate powder. I have found the pleasantness of the results very much favored by the addition of a very little carbolic acid,—a very small drop of the deliquesced carbolic acid in a drachm of solution. Credit for this suggestion belongs to our deceased member, Dr. J. W. Smith, who, within a few months after knowledge of cocaine first came to any of us, made the addition of carbolic acid, and found that the tendency to faintness, to nausea, to disturbance of the heart's action, and all the disagreeable feelings which are likely to result from the administration of cocaine, were very largely set aside by this addition of a small amount of carbolic acid. Without doubt numerous others have made the same discovery as independently as he did, but so far as I know he was the first.

*Dr. Hitchcock.*—I would like to emphasize what Dr. Allen and Dr. Brackett have just said. I have been experimenting with a weak solution,—one-fifth of one per cent.,—and have been surprised at the results. I used it to-day for the extraction of a lower molar root; the operation was painless. A severe toothache which would not yield to the usual remedies was instantly stopped by the injection of one-fiftieth of one-per-cent. solution of cocaine.

*Dr. Eames.*—After what has been stated, I cannot resist saying a word. We cannot be too emphatic in our thanks to one who has given us a practical talk on this subject. If there is one thing we should denounce with emphasis, it is preparations of a powerful drug, like cocaine, of unknown strength. The point I wish to bring up in futherance of what has been said by Dr. Hitchcock is, that we can in some cases control pain by an injection of warm water, or of cold water, into the gum. Recently a trial was made of this, and the patient said there was no pain whatever from the



extraction of a tooth, the injection being made with warm water. For many years it has been the practice of surgeons to inject chloroform at the seat of the sciatic nerve to cure sciatica, using the entire length of the needle; and in some instances they have used cold water with equally good results. I speak of this in furtherance of what has been said in regard to weak solutions.

Another thought was suggested by Dr. Brackett's words as to the use of carbolic acid. It seems to me that the addition of carbolic acid localizes the effect of cocaine, and that is what we want. I have used the phenate of cocaine daily for the past two weeks, and it seems to me it should have a somewhat similar effect; perhaps some of you can testify to this. I have reason to believe that cocaine has been shamefully used. I believe that many dentists ignorantly plunge the needle into the vascular parts beyond the hard gum-tissue; then we know there is an immediate and profound effect. The place where cocaine is most effective in operations involving the lower wisdom-teeth is also the most dangerous, because the surrounding parts are very vascular. I use cocaine on an average of perhaps six times a day, and find it of great value in operations in the nose and throat. I have no doubt that Dr. Stacey could say that he has used it very often in his practice.

*Dr. Stacey.*—The cocaine which is extensively used in the eyes is ordinarily a two-per-cent. solution, although in a great many cases a four-per-cent. is used. I rather think that cocaine injected about the head is more easily absorbed, and the effects are much quicker, than when injected in any other part of the body. I have never heard of any detrimental effects to the eyes from its use. There have been cases where, in using the four-per-cent. solutions, general poisonous results have been noted, and signs of collapse have required stimulants of the heart. Aside from that, cocaine is very useful in operations about the eye.

*Mr. H. Carlton Smith.*—Of course the application which Dr. Stacey refers to is purely external, and is entirely different from an injection. I don't think there would be any serious trouble from an atropine injection, if used in such strength as Dr. Stacey has spoken of to-night.

*Dr. Eames.*—I have a formula that I have used three or four times successfully as a local anæsthetic. The constituents are, Cocaine, 2½ grains; Tinct. belladonna, 6 drops; Carbolic acid, 1½ drops; Water, sufficient to make 1 drachm. The use of the belladonna, which is a heart-tonic, is to counteract the depressing influence of

cocaine; carbolic acid is a recognized local anæsthetic, and also restricts absorption. The dose is two drops.

*Dr. Allen.*—Do you expect a specific action from each drug in that combination?

*Dr. Eames.*—I do.

*President Smith.*—I have observed in one case, where a patient had extracting done under the influence of a hypodermic injection, that though the patient did not feel the extracting of the tooth, a severe sloughing of the gum resulted. In many of these obtundents there is not only cocaine to be looked out for, but there is also some other drug which causes this severe sloughing. These preparations are also used in attempts to obtund the gum in the fitting of bands, and this severe sloughing has taken place afterwards, due to the application.

*Dr. Briggs.*—The whole thing resolves itself into the intelligent use of cocaine. We cannot get along without it very well, but its use involves a great many points, and one point is the syringe-point, which may be dirty, and that might give rise to some sloughing or troubles of that sort. One speaker said he did not see how an injection could be made without hurting the patient. It can be done without any pain if the syringe-point is entered carefully and intelligently, and there are a lot of technical points on the way to use it, from the time you fill your syringe till the operation is completed. Of course we are supposed to do all those things carefully, but the trouble is, the man who would take up with a nostrum is apt to be the man who would also take up with a dirty syringe having a blunt point, and make the injection improperly.

*Dr. Eames.*—I deaden the sensibility somewhat by the use of cotton saturated with cocaine solution applied to the gum, and that allows the introduction of the needle without discomfort. I would like to ask Mr. Smith if hydrate of chloral is not easily decomposed? This might account for sloughing in some cases.

*Mr. Smith.*—I don't know. It would depend upon what else was put into the preparation. Hydrate of chloral cannot be used internally in an alcoholic solution to any extent, because you get an alcoholate of chloral, which is far more soluble and more poisonous than is the aqueous solution. Its action upon the gum would depend very much upon the other constituents of the preparation.

*Dr. Werner.*—I would like to ask if many of these obtundent preparations contain alcohol?

*Mr. Smith.*—So far as I have tested them, they do not to any considerable extent.

*Dr. Werner.*—Are you of the opinion that "Dorsenia," for instance, contains alcohol?

*Mr. Smith.*—I think it does, but not a large percentage.

*Dr. Werner.*—A patient of mine had an aunt who had a tooth extracted with "Dorsenia," and reported very favorably about it, and this patient, having a prejudice against nitrous oxide, decided to try the same remedy. I saw him about a week after, and he said he had been complaining of a sore mouth ever since the tooth was extracted, and that satisfied him thoroughly in regard to the use of injections. The extraction did not hurt him, but the injection was quite painful, and the sloughing points were distinct after the gum-tissues around the socket of the tooth had thoroughly healed.

*Dr. Brackett.*—I express the hope that the members present do not infer that this sloughing is a regular accompaniment of the use of local anesthetics.

*Mr. Smith.*—I would like to ask Dr. Brackett how he feels about the use of the preparations we have been discussing? So far as his ideas are concerned regarding the use of cocaine solutions of known strength, no objection can be made; but what of preparations of unknown value? How does he feel about them?

*Dr. Brackett.*—I have great satisfaction in being able to say that I have never used any one of the preparations in a single instance.

*Dr. Werner.*—The tendency is for a professional man not to use a nostrum. I think his conscience would not permit him to use anything of which he was uncertain as to its effect or its ingredients.

*Dr. Bradley.*—I have never used any of the secret preparations, though occasionally tempted to do so after receiving some of those plausible circulars. I have used cocaine more or less frequently in adjusting the rubber between the teeth or in the treatment of pyorrhœa, bathing the gums perhaps more than anything else. I have rarely injected it, and then only in a weak solution, and, as Dr. Brackett suggested, with the use of a little carbolic acid, and feel safe in doing so.

*Dr. Ainsworth.*—Is it a fact that in the face of the published analyses of preparations,—analyses,—that we really are using something the component parts of which we are in ignorance? I refer particularly to the analyses of the ten different preparations spoken of in an article by Dr. Kirk in the May (1893) *Dental Cosmos*.

*Dr. Smith.*—In certain cases, I know that the medical profession use manufactured preparations; but the formulas are published, and I suppose they consider that they are not nostrums.

*Dr. Ainsworth.*—The proprietors of these articles do not publish

their formulæ; in fact, the manufacturer of one of them claims in one of his circulars, in italics, that it is actually free from cocaine, while, if the analysis is to be relied upon, it contains two-tenths of one per cent. cocaine. Now, then, suppose we accept that analysis and use that preparation, are we using something that could be considered as an unknown preparation?

*Mr. Smith.*—Of course it is often impossible to make a complete analysis of the exact constituents. One of the preparations that I have analyzed, it is claimed, owes its efficiency to a drug that I never heard of before, and I doubt if a published analysis of such a drug could be found.

*Dr. Ainsworth.*—I have the impression that these analyses which occur in Dr. Kirk's article were made by parties whose interests were antagonistic to the manufacturers.

*Mr. Smith.*—Some substances can be detected by analysis, but other things cannot.

*Dr. Ainsworth.*—That answers my question.

*Dr. Eames.*—I hope the Academy will express its feeling with regard to secret preparations. I understand that Dr. Cooke made it as a motion that we utterly condemn secret nostrums, so-called, and to that end I should heartily second the motion.

*President Smith.*—The question before the Academy is the motion made by Dr. Cooke, that it is the sentiment of the Academy that it condemns all nostrums the analyses of which they are not familiar with.

The vote was thus carried by the Society.

*President Smith.*—We next come to "Incidents of Practice and Presentation of Specimens," and under that head I will relate to you an incident of practice and present a specimen. It is a case of bridge-work which came under my observation. A bicuspid root was implanted in the region of the upper first molar. The upper cuspid root was in place and was utilized. This implanted root, after its recovery from implantation, was banded with a gold band, and then teeth were attached from the cuspid root to a band on the implanted tooth. This was put in the mouth last May, and to-day is here for inspection. The bridge has been set in a plaster cast, just as it appeared in the mouth. You will observe the great amount of absorption that has taken place on the root of the implanted bicuspid.

*Dr. Hitchcock.*—Since hearing Dr. Whitney's paper on "Syphilis," read before the Harvard Odontological Society, I have noticed my patients' mouths more closely, and in some cases have decided to label the mouth mirror and use it only on that patient. I have also

come across three or four cases of tonsillitis, in one of which the tonsils were bleeding. The mirrors used on these patients were labelled and put aside. After operating on a consumptive the same thing should be done. According to most authorities, consumption is contagious from the sputa.

I soon found that the plan of having individual mirrors for special patients, as suggested by Dr. Upham, was an expensive one. It was thus that the idea of a metallic holder for adjustable glasses suggested itself to me. In the arrangement which I have devised the glasses are detachable from a metallic holder, and cost about twice the price of the rubber dam which we use in a single operation. The holder can be sterilized by boiling.

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#### CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

*The President.*—Gentlemen, you have heard the paper by Dr. Faught, and it is open for discussion. All visitors here are considered part of this meeting, and have the freedom of the floor accorded to them, and I hope they will take part in the discussion of this paper.

(For Dr. Faught's paper, see page 366.)

*Dr. Bogue.*—Mr. President, I do not feel that I can add very much to what has been said, for I so thoroughly coincide with the views of the essayist that it would hardly be fair for me to open the discussion; but I can say this much in corroboration of one point. I have in my practice a number of families in which an effort has been made, by special feeding, to solidify the tooth-structure, and my experience has been a little peculiar. The mother, on certain occasions, has, by advice of the physician, endeavored, by a course of special feeding and treatment, to secure perfect assimilation and the development of good dental tissue; and with certain children the work has been decidedly accomplished, while in the case of others in the same family the work has been neglected. In one particular case it was carefully observed in the first and third children, and in the second and fourth it was not. Those efforts have had very marked results.

*Dr. G. Lenox Curtis.*—The essayist has suggested a line of thought entirely new to me, and owing to the brevity of the paper and the fact of its being a suggestion only, some time is required to

consider the solution of the problem given. When it is clearly demonstrated that food received by the stomach can be prepared before it is taken so that when assimilated each organ will receive its requisite need, we will be under great obligations to the demonstrator.

Bearing upon this line of thought I will relate the case of a patient I have had under observation for twenty years, and will ask you for an explanation. From infancy everything was done by the parents to promote the development of the child, especially with a view to her having good teeth. Their efforts, apparently, were most successful, for a more healthy child and finely developed woman is seldom seen. Her teeth erupted several months in advance of the allotted time, and gave all indication of being perfect. When she entered womanhood and at about the age of fifteen, her teeth suddenly disintegrated, since when several of the molars have been lost owing to the death of their pulps and resultant alveolar abscess, and all but a few of her teeth have been several times filled by competent dentists.

Her health remains good. Cereal food was the chief article of diet during childhood. What was lacking, that the teeth did not withstand the action of the oral fluids? or what change took place in the general system to allow of such rapid destruction of her teeth? Can this be accounted for by artificial means of living indulged in after the age of fourteen?

*Dr. Jackson.*—I look upon dentistry as a true specialty of medicine, and it is the duty of every dentist to study this subject for the purpose of determining whether he can, by controlling the diet of his patients, be of benefit to them in the way of preventing the decay of their teeth. From analogy and from reasoning we must admit that the food that enters the system is intended to supply the different tissues with their elements in proper quantity to keep them in a state of health.

In this connection I would refer to a discussion, published in volume xxx. of the *Dental Cosmos*, that took place before the Odontological Society of New York on this same subject. I am a strong believer in the idea of supplying the system through the food with the elements that are needed, and I think it is the duty of the dentist to learn what those elements are and how to supply them so that assimilation may take care of and distribute them to the tissues where they are needed. We must first determine the elements that are wanting, as near as possible, and that we must do by chemical analysis. I have attempted to supply the wanting elements by feed-

ing preparations of phosphates. I understand that what is food for the nervous system is food for the bony system, only in different proportions. The physician of to-day is feeding phosphates in cases of nervous diseases. Why is it not proper for the dentist to prescribe phosphate-feeding for the purpose of preventing decay of the teeth and building up good bony tissue? There is a diversity of opinion existing in the medical profession in regard to the efficacy of phosphate-feeding; but if we intend to supply the wanting elements it will be, I think, through feeding those elements artificially. From my experience I am satisfied that we can, by the judicious use of phosphates in solution, supply the needed elements; and a favorite prescription of mine is equal parts of Hosford's acid phosphate and Fellows's hypophosphite. We might say, why not use the preparations laid down in the Pharmacopœia of the "United States Dispensatory," and recommend that as the physician recommends it. It seems to me that we will be fortified by the best minds of our profession and of the medical profession in adopting this treatment.

There was a patient in my chair this afternoon when my clerk reminded me that this was the night for your meeting here, and read to me the subject of the paper; and it so happened that the patient in the chair, the mother of a child, came to me five or six years ago with her teeth very much softened, and I advised her to take equal parts of Hosford's acid phosphate and Fellows's hypophosphite. I recommended this because I had known that Professor Thompson, of New York, was recommending the same preparation to his patients for nervous affections, and I don't know but he prescribed it for bone affections and caries. I secured very marked benefit from the treatment. The child was very fretful, was nursing, and the mother was in very poor health at that time, but she began to improve her condition immediately; the fretfulness of the child was entirely overcome; she now has a healthy child and is herself strong and healthy, and she tells me she believes she derived much benefit from the treatment. She has from time to time, however, taken tonics since. This is one of a great many cases which have shown much benefit from phosphate treatment. Formerly I recommended a lime-water preparation, but I think we get greater benefit from the combination named. Either of these should be taken through a tube. One is an acid preparation, and the other, Fellows's hypophosphites, contains more or less iron. I recommend my patients to take smaller doses of each of the medicines than the quantity prescribed in the accompanying directions,

and to take them only once a day,—in the morning after breakfast. I find it an excellent tonic, and I am sure my patients get a great deal of benefit from it.

In the discussion that I took part in before the Odontological Society I stated that the phosphates are to the teeth what they are to the soil and its products; that animals that feed on grass or other products of the soil that are deficient in phosphate invariably suffer with affections that are rapidly cured by better feeding. We know that Dr. Dwinelle believes that the use of phosphate preparations has assisted him in accomplishing work for the dental-tissues that he would not have been able to have secured otherwise.

*Dr. Meeker.*—Mr. President, Professor Mayr told us three years ago that in three or four cases that he had had for analysis from physicians in Massachusetts, of patients who had been given a certain quantity of Hosford's acid phosphate, he would produce the same quantity from an analysis of the urine within the next twenty-four hours; and from his knowledge as a chemist he seemed to think that acid phosphate would be of no use in the economy of nature. He also spoke to the same effect of Fellows's hypophosphite; but he said that a certain proportion of Fellows's hypophosphite was probably assimilated.

I remember that, some ten or fifteen years ago, when I had a little more ambition than I have at the present time, I thought it would be a very good idea to make my own preparation, and I used lactic acid and phosphate of lime. I soon became tired of it, because I found that my patients would not follow the directions I gave them for a sufficient time to accomplish anything; they might do it for a week, then they would stop. And how can we expect to gain much in this direction when children are given hot tea, coffee, hot soup, and a glass of ice-water? How can we expect anything but nervous children, with teeth deficient in lime-salts? You may be able to influence parents to adopt the prescribed regimen for a week or two, but then they become tired and quit. I think we must look for the improvement we wish for in the gradual evolution of the human race as we go along. We may not see it, but it will come in time.

*Dr. Stockton.*—Mr. President, this is a subject that has been discussed more or less for a great many years, and I don't know that we are much wiser to-day than we were when we first began its consideration. It is said that there is a balm for every wound in the *vis medicatrix* of nature, and if that be true we should be able to discover it, and if it were discovered we certainly should find some-



thing that would repair the loss that comes upon our teeth ; just as the physician and the scientist of to-day are able to discover remedies for other diseases. My attention has been called to a remedy by which, if the gentleman tells the truth, the discoverer is able to cure rheumatism almost invariably. Now, if it is possible that this gentleman has found a remedy for that painful and tormenting disease, why cannot we find a remedy for the ills that beset humanity concerning their teeth ? I am not enough of a scientist to discuss this subject except, in the language of my friend Dr. Luckey, on general principles ; but on these I think there must be something somewhere, that will be found some time, that will place us in a different and a better position from that which we occupy to-day. I know a family in which one boy has splendid teeth, and another and succeeding child in the same family will have teeth as bad as the other's are distinctly good. I know that succeeding children born of the same father by a different mother will have teeth of exactly the same characteristics ; one child will have a most perfect set of teeth, and the other as poor a set as can well be erupted. Why is it ? You would say that the same influences that produce the one perfect and magnificent set of teeth, all things being equal, would produce the same in another child. We know it is not so ; why it is we do not know. I wish I had the vivid imagination and command of language that our friend Dr. Dwinelle had. Before this Society, or perhaps some other, he portrayed the influence and effect of animal phosphates on the teeth in contradistinction to mineral phosphates. He told us that in some Eastern country—India or Africa—the people were dying by thousands of a disease that had formerly yielded to their remedies, although they continued to take, as they supposed, the same remedies that had cured them before ; but the man who prepared the medicine had become rich and sold out, and his successor used in the manufacture of the medicine a mineral instead of animal phosphate, and the result of this change was that the people died by thousands. It was finally discovered that they were using a different phosphate ; the animal phosphate was substituted, and the people were cured and lived. Now, if we could only discover some remedy of equal certainty for the diseases of the teeth, what a blessing it would be. It is well known that if you feed a dog for a few months upon starchy food, his teeth will decay. Therefore there must be something in feeding ; and if we knew what it was, we could take into our systems, as is shown in the case of the dog and other animals, something that would remedy this defect.

*Dr. Luckey.*—Mr. President, there is, but we will never reach it until we go back to the primitive habits of other days. Our present high state of civilization and our present modes of living are artificial and unnatural in almost every respect. The teeth of the people are not what they were a hundred years ago; much less perfect than they were five hundred years ago. If any one here present will take the trouble to inspect the skulls of the ancients down through the ages to within two or three hundred years, and note the difference in the dentures of those skulls from those we see in our offices to-day, he will be convinced that the reason of that difference and deterioration is the artificial and unnatural habits of our present state of civilization; which means French cooks, softened food, the eschewing of everything that requires mastication, and the rejection of that portion of the wheat kernel that we require for the upbuilding of our bony system. Professor Charles Mayr, of Springfield, Massachusetts, as Dr. Meeker has said, plainly stated, two years ago, that the preparations of phosphate of lime prescribed by the medical and the dental professions to be taken into the system for the upbuilding of bony tissue, are absolutely of no avail. I remember distinctly that many years ago, while I was at college, our professor gave us lecture after lecture upon the advantages to be derived from the administering of syrup of lacto-phosphate of lime for the upbuilding and preservation of the dental tissues, and he took the trouble to cite instances where one child in a family had soft and delicate teeth, subject to the usual ravages of decay, and a succeeding child, born when the mother had been under the care of a physician, and was subjected to special diet and the administration of phosphates and phosphites, would develop a perfect set of teeth in every respect, hard and perfectly formed; but in my studies in this direction I have been inclined to favor the theory of Dr. Mayr; my experience has not led me to believe that there is much advantage to be derived from the special dieting of any given child. I believe that if it were possible to isolate a child and bring it up upon a special diet, rich in phosphates, avoiding the prepared dishes which prevail at the present time, it might be possible to improve the bony tissue. Dr. Stockton has expressed a wish to know why one child in a family will have a perfect denture and another child in the same family will have an imperfect one. It is no more strange than the fact that one child will be a perfect Apollo and another child of the same parents will be a perfect abortion, a cripple, hump-backed, or deaf and dumb. Why it is so we may never know. The same rule applies to the teeth. The effects of

the diet and modes of living of the parents are undoubtedly manifested in the child, and the child is further affected by the manner in which it is brought up; and I think the remedy lies in a return to more primitive and natural ways of living, and it will take many generations to reach it.

*President Sanger.*—If you will allow me a word in that connection as to the statement by Professor Mayr on this subject: As I understood Dr. Mayr, he did not say that these remedies when taken into the system did no good. He did say that the phosphates taken into the system could be found in the excretions within twenty-four hours; but he said further that that was true of many remedies, and he did not care to say that in their passage through the system they did not aid nature in assimilating and using material which would otherwise not be used and assimilated. He did not say that he was prepared to deny the utility of administering the lacto-phosphates of lime.

*Dr. Luckey.*—That is not as I understood him.

*President Sanger.*—I talked with Dr. Mayr afterwards on this subject, and I used in the discussion an expression which caused some of the members to laugh. I said to Dr. Mayr, "I understand that while you do not claim that these remedies are utilized by the system, you believe they do act as a whip to stimulate otherwise sluggish glands, etc., to do their proper work in the system." Some of the members laughed at the word "whip." I think that if you will look at the minutes of the meeting at Asbury Park you will find that my impression of Dr. Mayr's remark is correct. We are all aware that many remedies are given, not because we expect their elements to be absorbed *per se*, but because of their effect upon the system, and they are afterwards eliminated by the use of other agents to throw them off. This is specially the case with mercury, which is not used by the system, but has to be eliminated by other agents.

*Dr. Luckey.*—As I understood it, the doctor's theory was that phosphates given as phosphates *per se* were absolutely of no utility or benefit to the human system, but that given in combination with foods, as in the cereals, they might be of some use; as given in the form of syrup of lacto-phosphate, and other chemical combinations, they are absolutely useless.

*Dr. Meeker.*—Mr. President, Dr. Mayr spoke especially of Horsford's acid phosphate. My question and his answer on that point are in the published report. He said he did not think the acid phosphate had any effect whatever on the human system. That was his own belief. As to Fellows's hypophosphite, he would not answer.

*Dr. Jackson.*—We are perhaps wandering from the subject as presented by the essayist. In the first place he makes a point on assimilation. You must understand that in order to assimilate well one must have a healthy body, and must follow such a course as will tend to bring the body up to a better state of health and to get better assimilation. The first necessity, then, would be exercise. The vital stimuli are food, air, and exercise; with plenty of exercise. We are intended to work, and to work in good air. While children are generally placed in school and their minds kept wrought up to the highest pitch it is impossible to expect a healthful physical stimulation.

In regard to the phosphates entering the system and being excreted without being assimilated or benefiting the body, I wish to say that I think the idea is a fallacy. We know that as we live now very little phosphate is taken in the way of food. The staff of life, the bread we eat, is made up almost entirely of the starchy part of the grain; about ninety per cent. of the phosphate in the grain is taken away in the gluten and the shell of the kernel of wheat. We find that a man secretes phosphates in the ratio of his mental activity; a student, or a public speaker, or any person who is especially exercised mentally, will show an increased excretion of phosphates. A student of lazy habits will secrete a very much larger proportion of phosphates than a man will who has considerable physical exercise, provided his brain is kept very active; in other words, mental activity means wear and tear and a breaking down of the vital forces, you might say. Now, how shall we supply the loss? You will observe that in my first remarks I suggested the taking of phosphates only once a day, and taking smaller doses than are usually recommended. Why? Because we are unable to assimilate the doses that are usually prescribed. It is the same with tincture of iron. Physicians are now giving very much smaller doses of iron than they were formerly; and they recommend that the treatment be kept up for a long time,—from four to six months,—and then an intermission for rest, after which the treatment is resumed. It is the same with the phosphates; in giving phosphates as a medicine you cannot expect to derive much benefit from them unless the treatment be continued for a long time and small doses are given. That fact should be thoroughly impressed upon the patient.

## Editorial.

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### WILL WE BE KNOWN BY ANOTHER NAME?

THE changes in the use of language and the definition of terms co-exist with the evolution of thought and the variations in the development of civilizations. The word used to-day to express an idea may not be satisfactory at a future period, and it is, therefore, quite essential that ideas should be clothed in new forms of expression to correspond with the modifications made necessary by the changed experiences.

When this general thought is applied to our profession it is recognized that we have reached a period of unrest, a desire almost morbid in character to alter the expressions of the past into something more definitely fitting the reconstructed ideas prevailing at present. This is particularly noticed in the attempts being made everywhere to change the nomenclature of dentistry to something different from that heretofore recognized. That this movement will have a good effect who may doubt? but that it will result in radical changes may well be questioned, for, as was remarked in a former article, forced changes in language, whether technical or general, cannot be made by proclamation or by learned essays, but must be the gradual development through forces not always clearly explainable, but still always consistent with the necessities of professions and peoples.

Words have their time of existence; their birth, slow development into the ideas of the world, their gradual change by usage, and, finally, they cease to represent the new thought and become antiquated, and are eventually lost.

The development of dentistry has given rise to many technical terms, not always well chosen, but they exist and are in active life to-day. The old age of these has not yet arrived, but it will gradually come as the profession develops, and new forms of expression are born of necessity.

It may be well, therefore, not to attack the old in endeavors to upset the forms of the past, lest in so doing the ideas they represent may be in a measure lost, and this is always to be deprecated. Den-

tistry, though comparatively young, has its "lost arts," and it is feared, if the iconoclastic efforts of some prevail, these may be multiplied, to the serious detriment of professional ability.

There is, however, a danger of fostering conservatism in this direction to an extent which may prove a serious bar to progress, and while the too liberal resort to new forms on the one hand should be regarded with disfavor, on the other the dogmatic assertion that no good can come from this effort to change technical terms must be accepted as a conservative error.

This train of thought has been presented to the writer by noticing that our French co-workers have adopted a term that seems to indicate that the twentieth century will show that even the title we have been known by from time immemorial will have become obsolete. It is not a new term, but is new to dental thought, and yet it carries with it so much that it seems destined eventually to relegate the word dentist to oblivion. The word in question is Stomatology.

The French have contributed largely to the advance of scientific dentistry. To Fauchard, Jourdain, Delabarre, etc., we owe a lasting debt, and now, under the leadership of the celebrated Magitot, there has been organized "The Society of Stomatology of Paris." To this body the word dentistry seems to have become effete. It was satisfactory when the operators of a former period were content with the care of the teeth, but at this time a word is required embracing all operations of the oral cavity in all their varied presentations, and no other one expresses this so completely as that adopted.

It seems as though the dentist of the future will cease to use the name as descriptive of his work, and he must by force of development become a Stomatologist, and be allied with other specialists, such as Dermatologist, Otologist, Gynæcologist, etc.

The force of this, it is surmised, cannot be controverted. The term dentistry has ceased to represent modern thought and practice on this subject, and must, therefore, give way to the newer word, which aligns the practitioners of this science and art along with the specialists of medicine.

Whatever may be the preferences of individuals, however much the love of the old term may cling to us, it is quite evident that the trend of thought is towards a coalescing of dentistry with medicine, and the terms used must be in accordance with this evolutionary process.

It is not probable that the world at large will ever accept the change proposed, so that there is no danger of dentistry ceasing to

be a part of the vocabulary of civilized peoples, but for professional use it is probably doomed, and we will be wise to recognize the fact.

That this is being made apparent in this country as a truth is evidenced by the recent organization of a society in Philadelphia, to be known as "The Academy of Stomatology." The strict scientific basis of this organization is more encouraging than even its name, for it aims to cultivate the true scientific spirit in all of its work. If this be carried out it will mark a new era in dental society life and procedures.

We must, therefore, welcome this word into the professional family, and cannot but feel that its adoption means the inauguration of a new order of things in dentistry, not the sacrifice of the cherished old, but the advancement of the entire body to meet the ever-changing current of professional thought.

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### THE ANNUAL CONVENTIONS.

THE year 1893 was devoted almost entirely, in this country, to the support of the World's Columbian Dental Congress, with the result that the two principal conventions were held over to the present year.

The dentists of the United States should, therefore, show additional energy in support of these meetings, and every effort should be made to make them worthy the increased experience in the work of the profession.

It is not probable that any change in the mode of conducting these annual gatherings will speedily be adopted, and until something better presents it is the duty of all interested to be present and take an active part in their deliberations.

The American Dental Association will meet at Old Point Comfort, Va., August 7, and it is presumed that the Southern Dental Association will also convene at that place, though at this writing we have not received the official call for that meeting.

The National Association of Dental Faculties and National Association of Dental Examiners will, without doubt, meet at the same time and place.

The American Dental Society of Europe, having omitted its meeting last year, will hold its nineteenth convention this year at Geneva, Switzerland, August 6, 7, and 8. Members of the profession everywhere are cordially invited to be present.

Many of the State organizations meet in July, claiming special attention, and will be, from present indications, well attended.

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### THE SEMI-CENTENNIAL OF THE DISCOVERY OF ANÆSTHESIA.

A VERY general interest in this matter has been awakened, and a number of local associations have decided to make the event of marked interest.

The editor of the *Buffalo Dental Practitioner and Advertiser*, Dr. Barrett, suggests "that every dental society in the land, as far as possible, appoint delegates to meet at Old Point Comfort at the time of the annual sessions of the American and Southern Dental Associations, there to agree upon some concerted plan of action."

It is hoped all associations will instruct their delegates to meet with this proposed body, and if not too late in the year arrange a definite course of procedure. If a national celebration of the event be deemed impracticable, a day might be decided upon for all the societies in the country to meet in their several localities and make the occasion not only impressive, but one of marked historical interest.

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## Bibliography.

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THE DISCOVERY OF MODERN ANÆSTHESIA. BY WHOM WAS IT MADE?  
A BRIEF STATEMENT OF FACTS. By Dr. Laird W. Nevius,  
Specialist, New York.

This book seems to be another effort to solve a problem already settled in the minds of intelligent readers,—that of the discovery of anæsthesia. The author has undertaken to "compile in one small volume undeniable facts and figures . . . by what means or under what circumstances each of the four aspirants performed their first operations upon the basis of which they claimed the honor of being the original discoverer."

It is very evident that the author, while he claims impartiality, entertains the opinion that Dr. Crawford W. Long, of Georgia, is



entitled to the credit of discovering anæsthesia, for he is placed first in the series of biographical chapters. While this gentleman claims to have used ether in 1842, and that he first saw it noticed in the *Medical Examiner* for December, 1846; he "was prevented by a very laborious country practice" from communicating his discovery "until the *Medical Examiner* for January, 1847, was received. . . . On reading these articles I determined to wait a few months before publishing an account of my discovery." This probably brings it to near the close of 1848, or six years after the alleged discovery, and four years after Wells had proved the value of nitrous oxide as an anæsthetic. It is quite safe to dismiss Dr. Long as one of those discoverers too late for recognition.

The book contains excellent illustrations of Drs. Long, Wells, Riggs, Jackson, and Morton; the monument to Dr. Wells erected in Hartford; Ether Monument, Boston; bust of Sir James Simpson, and full length illustration of this discoverer of chloroform, and also Dr. Colton.

The book is presented in a very satisfactory manner as far as general make-up is concerned, but the insertion of the full length illustration of the author as a frontispiece, and his office on another page, with himself and assistant at work, is in such exceeding bad taste that it will tend to destroy what might have otherwise been a valuable contribution to the literature of the subject.

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## Current News.

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### AMERICAN DENTAL ASSOCIATION.

THE Thirty-fourth Annual Session of the American Dental Association will be held at Old Point Comfort, commencing at 10 A.M., Tuesday, August 7, 1894.

GEO. H. CUSHING,  
*Recording Secretary.*

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### AMERICAN DENTAL SOCIETY OF EUROPE.

THE American Dental Society of Europe will hold its nineteenth meeting at Geneva, Switzerland, August 6, 7, and 8, 1894. Last year this annual gathering was omitted, as many members wished to attend the Columbian Dental Congress. American colleagues

who may be taking a summer vacation abroad are cordially urged to combine with their plans for travel and sight-seeing a visit to their professional brethren in Europe, and to join in the various exercises of the occasion. Members of the profession everywhere will be welcome. Programmes may be had on application to the President, Dr. L. C. Bryan, of Basel, or to the undersigned.

CHARLES W. JENKINS,  
*Secretary.*

NO. 1 SONNENQUAI, ZURICH.

### SPECIAL NOTICE.—MEETING OF THE AMERICAN DENTAL ASSOCIATION AT OLD POINT COMFORT, AUGUST 7.

ARRANGEMENTS are under way, but have not yet been completed, for a reduction in railroad fare for the annual meeting of the American Dental Association, to be held at Old Point Comfort in August next.

We expect a reduction of one and one-third fare for the round trip on the "Certificate Plan." In order to get this reduction, full fare must be paid in going to the meeting, *and a receipt taken therefor from the ticket-agent at the starting-point*. This receipt (certificate) must be countersigned by the Secretary of the Association at the meeting, and will enable the holder to return for one-third fare, provided one hundred certificates are presented, showing that at least that number have paid full fare on the various railroad lines entering the place where the meeting is held.

A circular giving full particulars will be mailed later to all members and to those who apply for information.

J. N. CROUSE,  
*Chairman.*

2281 PRAIRIE AVENUE, CHICAGO, June 18, 1894.

### ILLINOIS STATE DENTAL SOCIETY. -

At the Thirtieth Annual Meeting of the Illinois State Dental Society, held at Springfield, May 8-11, 1894, the following officers were elected for the ensuing year:

J. W. Cormany, Mount Carroll, President; S. F. Duncan, Joliet, Vice-President; Louis Ottofy, Chicago, Secretary; W. A. Stevens, Chicago, Treasurer; Grafton Munroe, Springfield, Librarian.

The next meeting will be held at Galesburg May 14-17, 1895.

LOUIS OTTOFY,  
*Secretary.*

MASONIC TEMPLE, CHICAGO.

# THE International Dental Journal.

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## Original Communications.<sup>1</sup>

### SOME OBSERVATIONS ON THE EXTRACTION OF TEETH TO PREVENT DECAY.<sup>2</sup>

BY EUGENE H. SMITH, D.M.D., BOSTON, MASS.<sup>3</sup>

MR. PRESIDENT AND GENTLEMEN,—The idealist has lived in all ages, playing an important part in the shaping of opinions. He exists at the present time and influences all conclusions. Rambler, to my mind, emphasized a great truth when he said, "There will always be a wide interval between practical and ideal excellence;" and it seems to me that one attains to the greatest good in this practical life of ours and in our professional work when he plans and puts into execution that which gives to his patients the greatest practical benefit.

Our literature abounds with varying opinions in regard to the extraction of the permanent teeth as a means to the prevention and correction of irregularities and the lessening of decay.

The models of the cases I show you to-night are not those where extracting was done for the correction of irregularities, but for the purpose of eliminating one of the great causes of early and exten-

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<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

<sup>2</sup> Read before the Harvard Odontological Society, March 29, 1894.

<sup>3</sup> Instructor in Orthodontia, Harvard University.

sive decay in teeth of poor structure,—that of lateral contact with pressure.

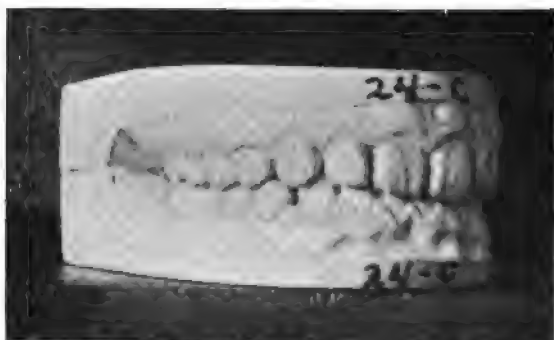
A gentleman, an idealist, writing on this subject thirty-five years ago, says, "There may be some extraordinary cases in which parting with a tooth does no harm," but generally the extracting of a bicuspid or a sixth-year molar destroys the whole character and beauty of the mouth, and that in a majority of instances the loss of these teeth is an unjustifiable interference with nature, and is virtually assuming that the all-wise Creator of the universe made a grand and radical mistake in the organization of the human family."

Could this writer to-day see the patients of our infirmaries, he could not help but conclude that a grand and radical mistake had been made, and that there really was something wrong somewhere, and only through the judicial extraction of some one or more teeth could improvement be made and the practical value of the teeth be maintained.

Opinions very similar are held and published to-day giving evidence of the idealist's presence. The other extreme, of extracting teeth in pairs and double pairs, is also held as the proper method of procedure; some going so far as to lay down exact rules as to the teeth to extract and the age at which they should be extracted.

Very great evil has been the result of improper extracting, and much mischief caused by the attempt to save too many teeth. It is from the observation of the widely different results that are formed such diversities of opinions. These opinions, however, lose very much of value when we consider that in a majority of the cases judged no models were made showing the condition before extracting, while models of the condition after extracting are presented in evidence of the mischief produced.

The few cases which I present to you this evening are from my private practice, where impressions of the mouth were taken and the conditions noted previous to extracting, and again after some lapse of time. The first case to which I ask your attention, represented by Models 24, A, B, and C, is that of a boy thirteen years of age; teeth of poor structure, very sensitive, and rapidly decaying. In October, 1889, the sixth-year molars were extracted, and they were chosen on account of their condition. You will observe that the teeth are not overcrowded and that the molars were extracted that the other teeth might drop back and thereby prevent decay of approximal surfaces. In this case, had the molars been in any good condition, I should have extracted four bicuspids. Model B shows the position of the teeth in March, 1890, and Model C



The models No. 24 will serve to illustrate the text, it not being deemed necessary to give all described in the paper.









their position in 1893, with decay almost wholly stopped and the mouth in a thoroughly healthy condition.

The second case, Models 28, A, and B, is that of a young man, aged twenty-five years. Model A shows the condition in September, 1881, when I extracted the lower sixth-year molars. Some time during his teens he had had extracted the superior right sixth-year molar. You will observe how nicely the teeth are in line on that side, while on the other side, and on the lower, the teeth project and are much crowded. There was but little approximal decay on the side where the molar had been extracted, while all other approximal surfaces proved easy prey for its ravages.

Model B shows the position of the teeth when I extracted the upper left sixth-year molar, and which I feel now should have been done at the time I extracted the lower. Since then no impression has been taken, as the teeth are still moving back; slowly, of course, at his age. Approximal decay has diminished. In a short time I hope to take another impression showing the condition at the present.

Models 32, A, B, and C represent the case of a boy aged eleven years at the time of extracting the four sixth-year molars in November, 1889. They were selected on account of their very poor condition, as is shown in Model A. You will observe by these models that the teeth were affected by that malformation of their lower third due to the influence of some of the eruption diseases common to early childhood. These teeth were of poor structure and suffering from approximal decay. Models C and B show the change that has taken place,—the teeth slightly free from contact, and approximal decay absent. This case, as to the position of the teeth, is not quite all I could wish, on account of the upper incisors having dropped back to the extent of occluding directly on top of the lower incisors, but this condition is due to the fact that the malformed lower third of the upper incisors became broken off in an accident at foot-ball, preventing the over-shutting of the upper incisors to maintain the natural occlusion.

Models 34, A, and B. Case, a girl, aged thirteen years. Model A shows the condition at the time of the extraction of the three sixth-year molars in March, 1886, the other sixth-year molar having been extracted previously to the patient's coming under my care. The molars were selected in this case on account of their very poor condition, as their presence in the model testifies. The teeth of this young girl were of a very delicate structure and decaying rapidly.

Model B shows the change of position of the teeth in May,

1890. From the time of extracting, decay perceptibly diminished. You will observe that in the lower jaw the twelfth-year molar was erupted, while in the upper the twelfth-year molar had not appeared. In the upper the twelfth-year molar has come forward, maintaining an upright position, while in the lower the twelfth-year molar is slightly tipped forward, but not enough to mar a good and useful occlusion.

Models 67, A, and B show a case of a young miss fifteen years of age. The condition of the sixth-year molars is shown in Model A. They were extracted in April, 1890. It was at this time that the patient came under my care. Approximal decay was considerable, and the teeth were below the medium in structure. Had the sixth-year molar been in good condition, I probably should have extracted bicuspid, if any.

Model B shows the change that had taken place in October, 1893. Approximal impingement has been lessened just enough to change materially for the better the condition of decay. You will see by Model B how nicely the twelfth-year molars have come forward, without tipping, into the place of the sixth-year molars, giving the wisdom teeth an opportunity for usefulness rarely accorded them. The occlusion is well-nigh perfect, and a slight overlapping of the upper centrals has been righted.

Model 89. Case of a girl, aged fourteen years. Model A shows the condition in October, 1891, when the sixth-year molars were extracted. The teeth of this young girl are very delicate, and the molars were extracted to relieve the lateral contact and on account of their poor condition.

Model B shows the position at the present time,—decay very much lessened and the gum in a healthy condition. In all of these cases the sixth-year molars were the teeth extracted, for the reason that they were much poorer teeth than the others and in most of the cases decay had involved the pulp, and the probability of their being made useful teeth for many years was extremely doubtful. The present condition of these cases, as regards appearance, occlusion, and lessened liability to decay, is to my mind an endorsement of the extractions.

Much study should be given to all cases of this kind; and, in the absence of tabulated records, each case for the present must, in a measure, be a law unto itself.

If the teeth anterior to the sixth-year molars are very much crowded, so as to amount to an irregularity, I prefer to wait before extracting the sixth-year molars,—provided those are the teeth to





be extracted,—until the twelfth-year molar is well in place, in order that the teeth may move back while the twelfth-year molar remains nearly in its eruption place. In case I wanted the teeth to move back but a little, I should extract the sixth-year molars just as the twelfth-year was appearing. This would allow the twelfth-year molar to move well forward into the place of the sixth-year, and at the same time allow the anterior teeth to separate sufficiently to lessen approximal decay.

In this paper I have not deemed it wise to enter into any elaborate discussion on the theory of extraction, but simply to present a contribution of recorded cases to a problem much discussed and still unsolved.

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## AN INTERESTING CASE OF EXOSTOSIS; ASEPSIS IN OPERATIONS.

BY ALBERT WESTLAKE, D.D.S., NEW YORK.

TUMORS of the oral cavity are always an interesting study to the dental as well as to the general surgeon.

Those of our own profession, whose environments are in large cities and are associated in hospital work, frequently have specially abnormal conditions of this region come within their observation and care.

I do not consider that our dental colleges give any too much time and attention in their curriculum to the physiological and pathological conditions of the jaw and its surrounding tissue.

The diseases of the mouth is a study of vast possibilities, and should be dealt with in an equal, if not more exhaustive, manner than the mere mechanical filling of teeth, as such teaching will lead to an improved aseptic treatment of these parts by the graduate. Numerous cases have been cited in the past, and the librarians of our hospitals can greatly enlarge the list, where the malignant growths in the mouth can be traced to failure of cleanliness in dental operations.

This may be an "old saw," but the changes should be rung out on this subject to not only impress our brethren in the smaller cities and towns, but many of our metropolitan practitioners with the importance of thorough asepsis in both instruments and materials. When we witness the minute attention given such details by our general surgeons in even minor operations, we feel a sense

of regret that the majority of the matriculates of our dental colleges do not avail themselves of its refreshing influence by attending the public operations in the amphitheatres of our hospitals. On the theory that cleanliness is next to godliness, the millennium is approaching through the surgical profession.

In my association with the surgeons in private operations, I have found the same adherence to absolute cleanliness that they exhibit in hospital work.

I have presented these thoughts as a prelude to reporting an interesting case as represented by the accompanying figure. Although of a benign nature, the removal of the tumor occupied probably not more than fifteen minutes, yet the details connected with its excision were as complete as was exhibited in the extirpation of a tongue by the same surgeon which I witnessed at the post-graduate hospital one hour later.

The various instruments were previously boiled in soda solutions for one hour and a half, and brought to the private house where the operation was to be performed in a well-arranged receptacle, each one wrapped in antiseptic cotton. The hands and nails were thoroughly cleaned and white aprons donned by the surgeon and assistants. The instruments were placed in the usual porcelain and glass dishes and the necessary irrigators were in readiness. The operation was performed by Dr. Robert Abbé, by making a cross incision over the osteoma in the median line and dissecting back the muco-periosteum, exposing the hard surface of the tumor.

To save the shock to the brain, which might result from heavy chiselling, I used, at the request of Dr. Abbé, the dental engine and wheel-saw, cutting well into the base of the growth at several points. Following this, forceps were applied to remove the bone, in pieces, with no shock whatever. The tumor had no pedicle and did not involve the vomer.

The muco-periosteum was then brought together, and an iodoform compress held in position by a silk ligature crossing from opposite twelfth-year molars. The tumor was of twenty years' growth, and from its peculiar position, I consider it of sufficient interest to present in this manner. We frequently find exostosis on both inferior and superior maxillary borders and exostosis of their cavities. They of course have a dental bearing, but this is the first instance I have met with of an eburne or ivory exostosis, involving only the median line and having no apparent connection with the alveolo-dental wall.

There was no special pathognomonic feature, as the patient had

not complained of any uneasiness in the tumor or of adjacent parts. The size of the tumor, however, had become an annoyance in eating and an impediment to speech. Its surface also had begun to ulcerate, painlessly. Dr. Abbé informs me that nine-tenths of the malignant growths on the tongue he has had to deal with are traceable to irritation due to ragged edges of teeth.

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### MASSAGE IN RHEUMATISM OF THE TEMPORO-MAXIL- LARY ARTICULATION AND MUSCLES OF THE LOWER JAW.<sup>1</sup>

BY DOUGLAS GRAHAM, M.D., BOSTON, MASS.

ON January 7, 1891, there came to my office a young lady, nineteen years of age, who was naturally slim, delicate, and loose-jointed. She had difficulty in chewing, difficulty in articulating, and, on examination, it was found that she could open her mouth but three-eighths of an inch between her front teeth, and that the lower jaw receded behind the upper three-eighths of an inch. The muscles that elevate the lower jaw were rigid and stiff, and on account of the difficulty in chewing, her diet was mainly liquid. Attempts at pulling the jaw downward and forward caused pain. This state of affairs had existed for about ten days, and for eleven days before this she had been much worse. By dint of cross-questioning I learned that three weeks before she came to me she woke up frequently at night clinching her teeth and dreading to move her jaw, and that for four or five days afterwards she was feverish, had bad breath and sour-smelling perspiration; from which I inferred that she most likely had an attack of acute articular rheumatism, in which the muscles and articulations of the lower jaw alone were affected.

After thirty minutes of massage to the muscles of the lower jaw, inside and out, alternating with careful, forcible depression and forward traction, the mouth could be opened voluntarily farther and easier, much to the delight of the patient. The following day she reported that she could chew a little better, and had more "catches," as she called them, than she had when she was well. Before massage this day she opened her mouth five-eighths of an inch, a gain of two-eighths over the previous day; and after massage and pulling

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<sup>1</sup> Read before the American Academy of Dental Science, April 4, 1894.

for twenty or thirty minutes she opened it thirteen-sixteenths of an inch, a further gain of three-sixteenths of an inch; and the lower front teeth were one-fourth of an inch behind the upper, an improvement of one-eighth of an inch in this respect. Next day she opened her mouth thirteen-sixteenths of an inch before massage, fourteen-sixteenths after. Forced opening hurt less than formerly, but as yet there was no perceptible lateral motion, though the muscles felt stronger to her. The day after this she opened the jaw fourteen-sixteenths of an inch before massage, fifteen-sixteenths after; and there was very decided lateral motion to the left, more than to the right. Two days later she opened her mouth fourteen-sixteenths of an inch before massage, and the same after massage and forced depression; and as this did not cause any more discomfort, it seemed as if "we had got to the end of our rope." Hitherto there had been a feeling of lameness for an hour or so after treatment, and when this passed away the muscles and joints felt better than before; and this is usually the way that muscles behave after massage, when suffering from muscular rheumatism. The lower front teeth then closed one-sixteenth of an inch behind the upper, a gain of five-sixteenths of an inch in five days.

At the end of a week the patient reports that she does not get so quickly tired in eating, and that the food does not lodge, nor the jaws "catch," as formerly, even when she considered herself well. Still she knows that the mouth does not yet open as far as it ought to, for she cannot get her tooth-brush "away back." At the end of nine days she can chew well with both sides, and talks almost naturally; and there is no discomfort in forced depression of the lower jaw, which now opens fifteen-sixteenths of an inch voluntarily. January 21, two weeks from the time we began treatment, the jaw slips less than it has for more than a year, and the muscles feel firmer and stronger; opens voluntarily one inch, and lateral motion increases. Five days later opens jaw one and one-eighth inches, chews vigorously, and articulates easily, and apparently is better than she was before she had this trouble. She had eleven massages, with forcible downward traction, and some pulling at home by herself at stated times, as directed.

Six weeks later she came to me again, stating that the jaw had been well until that morning, when, chewing a piece of soft bread, she had an unusually severe "catch," which left an ache and a swollen feeling. Before massage and pulling she opened her mouth on this date one and a half inches, a gain of half an inch since she last visited me; after massage, one and eleven-sixteenths, a gain



of three-sixteenths of an inch in about twenty minutes, and the muscles, as she said, "felt real nice and the tied-up feeling gone." She visited me twice more at this time and has since continued well, as I have been informed by her parents. At her last visit to me I advised her not to pull any more at her lower jaw, for I found that one and eleven-sixteenths inches was much more than I could open my own mouth. Of late I have measured the distance between the front teeth of a number of people, and find that the average space they can open their mouths is one and a half inches. In this lax-muscle, loose-jointed individual, it seemed as if we might easily have gone too far in our efforts at making the mouth open wide. And in this connection I could not help recalling the epitaph on a Southern tombstone:

"Here lies Robert Gordin,  
Mouth almighty and teeth accordin';  
Tread lightly over this great wonder,  
If he opens his jaw, you're gone, by thunder!"

A few words as to diagnosis. The painful cutting of a lower wisdom-tooth is said to sometimes cause a spasmodic contraction of the masseter muscle by contiguous irritation. The spasm is described as being continuous and persistent, not varying in intensity, but a true tonic spasm, the muscles being permanently set so as to keep the jaws nearly closed and susceptible of only slight separation. The pain varies much, being frequently of a dull aching character like rheumatism, for which it may be mistaken, being diffuse and erratic, and may extend up the side of the head and down to the shoulder. I do not think that the case just reported was one of this kind, for other joints had behaved in a similar manner to those of her lower jaw. Prior to two years before I saw her she had had slipping of her hip-joints with pain, often causing her to fall, and this troubled her for a year; and for two years she had snapping and cracking of the joints of her arms and shoulders on putting her arms to her head, and when she came to me there was pain in her left shoulder which could hardly be called anything but rheumatism. Moreover, the physician who attended her during the few days of the acute febrile trouble in connection with her jaws has recently been my patient, and he remembers the case distinctly as one of acute rheumatism of the temporo-maxillary articulation.

With regard to causation, it would seem as if the muscles of this patient's lower jaw acted in a hesitating, stammering, inco-ordinate manner, much in the same way that the muscles of the hand and

arm do in some cases of writer's cramp and allied affections, the treatment of which by massage and systematic exercises frequently results favorably. And in loose-jointed individuals it is possible that lax-muscles may allow too much traction upon the ligaments, the irritation of which may beget contraction or contracture of the muscles in order to protect the joint. Slight irritation arising in this or any other way might be sufficient to excite rheumatic arthritis and muscular rheumatism in those predisposed thereto.

The muscles that raise the lower jaw (the temporal masseter and internal pterygoid), as well as those that move it forward (the superficial portion of the masseter, the internal and external pterygoid) and backward (the deep fibres of the masseter and posterior fibres of the temporal) and laterally (the internal pterygoid), seemed to be in a state of subacute myositis or muscular rheumatism, their fibres agglutinated so that they could not glide freely over each other, but contracting partially and irregularly, and pulling unequally, causing unnatural pressure and traction upon terminal nerve-filaments. This condition is quite amenable to massage in other muscles, and probably here also, if care be taken not to attempt too much at one time and thus increase the irritation. As the depressors of the lower jaw (the digastric, the stylo-hyoid, the mylo-hyoid, and the genio-hyoid) must suffer in their circulation and nutrition from inactivity when the mouth cannot be opened, they also received massage. These muscles, together with the temporal and masseter, are the most accessible to external manipulation, while those attached to the inner surface of the lower jaw are very inaccessible and can better be acted upon by passive and active motion. Indeed, the anatomical arrangement of the structures of the temporo-maxillary articulation is not so favorable for massage as is that of the joints of the limbs where we can get all around them.

We are probably safe in presuming that the glenoid cavities in this patient were too large for the condyles of the lower jaw, and that the anterior aspect of these was most likely encroached upon by rheumatic thickening. This was not so easily got at. But a little reflection will convince one that joint-surfaces can be made to exercise an intermittent compression—a sort of massage—upon each other, by means of active and passive motion, whereby the trituration and absorption of deposits in and around them can be hastened.

Cases of rheumatism affecting the temporo-maxillary articulation and muscles of the lower jaw may frequently be seen by gentlemen in the profession of dentistry, but I think they are so rarely met with by others that they are apt to be considered as belonging

to some unknown and unclassified list of affections. Professor Andrews has recently sent me a similar, almost a parallel, case to the one just reported, in which no gain in opening the mouth was made until the depressors of the lower jaw had received special attention in the way of massage and resistive motion; that is, opposing contraction or attempting to hold the mouth closed by pushing upward upon the chin while the patient opens the mouth, being careful to keep the resistance less than the strength of the contracting depressors, which requires some practice in order to graduate the resistance instinctively. This case has not been sufficiently long under observation to say much about it.

The effects of massage in such cases would seem to be simultaneously upon the muscles, nerves, and circulation: upon the muscles, separating adhesions between their fibrils so that they can glide freely over each other, thus preventing partial and irregular contractions and removing undue pressure from terminal nerve-filaments; upon the nerves, whereby not only is pressure removed, but a direct sedative effect is produced; upon the circulation, so that it is increased in speed and quantity in the parts *masséed*, thus bringing more nutritive materials and removing more waste products. These influences indirectly affect the joint, which, however, is more acted upon by passive and active motion, which tend to break up deposit, adhesion, and thickening, to spread them over a greater surface, and to propel them onward into the lymph- and blood-currents. Resistive movements train the muscles to act steadily, strongly, and regularly, and thus suppress irregular, spasmodic, and useless movements.

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## ON SOME RELATIONS OF DISEASES OF THE NOSE AND THROAT TO DENTISTRY.<sup>1</sup>

BY JOHN W. FARLOW, M.D., BOSTON, MASS.

It gives me great pleasure to meet, in a social way, you gentlemen of the dental profession. In our daily work, no matter how interesting or absorbing, we must certainly acknowledge that most of the time we look "down in the mouth." But to-night with our palates in good working order, we can take a more cheerful view of life. We all know that in our homes, especially if we live in

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<sup>1</sup> Read before the American Academy of Dental Science, April 4, 1894.

apartment houses, we are very much interested in, and not infrequently very much annoyed by, what goes on overhead. Just so it is, or should be, of great importance to the dentist to know what is going on in the story above the mouth. The roof of the mouth is the floor of the nose, and what affects one must certainly have its influence on the other.

The mouth is for eating and speaking, and is not intended to replace the nose in breathing. The nose has for its functions to warm and moisten the inspired air, and this can be done by the mouth to but a very limited extent. When a part of the body is obliged to do what it is not adapted for, the work is usually badly done.

Let us consider for a moment what are some of the conditions of the nose which throw upon the mouth work it ought not to be called on to perform. The nose is divided into the two nostrils by the nasal septum, made up of the anterior or cartilaginous part, and the posterior or bony part. Bends, ridges, or outgrowths of this septum can so occlude one or both nostrils as to make the nose unable to fulfil its functions, and the open mouth results. As a matter of fact, it is very uncommon to find a straight septum after childhood, and great obstructions in the nostrils are very common. If the roof of the mouth is very high, it is generally the case that the nasal septum is much bent, causing a blocking of the nose to such an extent that the respiration must be carried on by the mouth. It is needless for me to call your attention to the deleterious effect on the teeth of the constant passage of air through the mouth.

On the outside of the nostrils are the turbinated or spongy bones, which are extremely liable to hypertrophy, thus closing more or less completely the nasal passages. If this condition becomes chronic, it is a very effective means of closing the nose and hindering the entrance of air.

Nasal polypi of sufficient size to fill the nostrils are an occasional cause of mouth-breathing. The most important and, until recently, the least recognized of the diseases obstructive to nasal respiration is the one so common in childhood and early adult life, —adenoid disease, or the growth of an excessive amount of lymphoid tissue in the post-nasal space. Occurring before, or at the time of, the second dentition, by preventing the passage of the air through the nostrils it causes a narrowing and elongation of the upper jaw, with the high or V-shaped palate and a crowding together of the teeth, especially the central incisors. The upper lip is short and does not cover the teeth, and the aperture of the mouth becomes triangular. Another symptom lately spoken of is saliva-

tion. It is no wonder that such children are very prone to all sorts of displacements and tardy appearance of teeth, as well as marked tendency to decay. According to my experience, it is by all means the most rational plan to try to restore the nose to its proper function before undertaking the difficult and irrational task of bringing the jaw and teeth into their proper places while the thing which caused the deformity is still acting. It may be that I am advocating a course which will give the dentists less to do in the future, but there will certainly be fewer deformed mouths and fewer decayed and false teeth among your patients if the post-nasal spaces of your young and growing patients are freed from their obstructions.

This question of post-nasal obstruction is so important, and leads to such disastrous results with regard to the mouth and teeth when not properly recognized and treated, that it seems to me that dentists should never neglect to inform themselves in all cases of high or V-shaped palates or elongated jaws, or where the incisors overlap or the teeth very readily decay, whether there is not some obstacle to nasal respiration and consequent faulty development of the bones of the nose and mouth.

The symptoms in such cases are mouth-breathing, especially at night, short upper lip, triangular mouth, thick voice, snoring, frequent and long-continued colds in the head, occasional attacks of deafness or pain in the ear, cough, and possible lack of development. Any or all of these symptoms may be present, but the absence of some of the most prominent ones should not lead you into the possible error of therefore concluding that the post-nasal space is not considerably occluded. I have removed very large adenoid growths where many of the classical symptoms were wanting. The rhinoscopic mirror or digital examination will be requisite to make an accurate diagnosis.

In children large tonsils are nearly always accompanied with adenoid disease; and if, in looking into the throat, there are found large raised follicles on the posterior pharyngeal wall, standing out like large, red, swollen grains of tapioca, we may reasonably infer that the same condition, only much more marked, exists in the post-nasal space. The glands under the angle of the jaw are apt to be large and tender. I have thus far spoken of the bearing that various nasal diseases have on the jaws and teeth, and now I should like to say a few words about how they add greatly to the dread that some persons have of the dentist's chair. I never expect to meet in this world any one who will say that he really enjoys his

seance with the dentist. It is merely a question of degree of discomfort. I think very few of you would enjoy yourselves if, while suffering from a bad cold with blocked-up nose, you had to spend an hour with your mouth open and filled with napkins, drills, or a rubber dam. You would probably write to have your appointment put off.

But persons with bent noses and large turbinated bones are in the state of being stuffed up all the time. A child who has great difficulty in breathing at night, even with the mouth wide open, who snores and kicks off all the bedclothes, cannot be expected to look on the dentist's chair as much short of an invention of the devil.

I think much can be done to bring about a more friendly relation between dentist and patient by certain simple means. If there is considerable secretion in the nose, as is apt to be the case, it is well to have the patient use an alkaline nasal spray in an atomizer. This properly used can help to clear the nose and post-nasal space. Then a weak solution of cocaine, about two or four per cent., either in water or liquid vaseline, instilled into the nose just before getting into the dentist's chair, will often reduce the swelling of the turbinated bone sufficiently to allow a free passage of the air through the nose. Cocaine used in the pharynx causes a disagreeable, choking feeling, and should be avoided.

There are many noses that weep or discharge a copious, watery mucus a good deal of the time. This is particularly the case in young, nervous women and sufferers from what is like hay-fever, except that it comes on under any excitement and not at regular seasons. A small dose of atropine, about  $\frac{1}{100}$  of a grain, taken three or four hours before the visit to the dentist will often stop the leaking nose, and the handkerchief can be kept in the pocket instead of constantly at the nose.

Dr. Farlow showed a girl, thirteen years of age, whose upper jaw was very long, narrow, and high (Fig. 1). She had all the typical signs of adenoid disease,—thick voice, mouth-breathing, deafness from disease of both ears, etc. Later, he removed from her post-nasal space, by means of large forceps, the adenoid mass, which is shown here, in exact size, in Fig. 2.

FIG. 1.

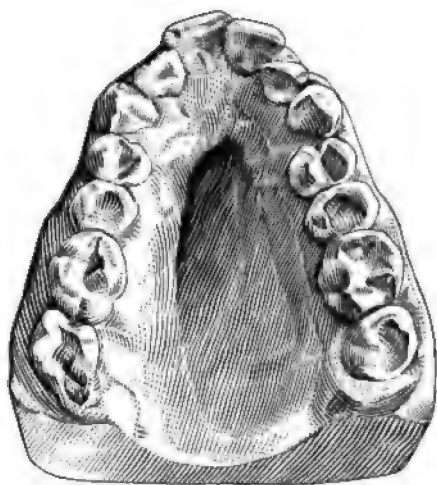
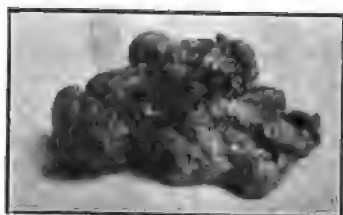


FIG. 2.







## HOMŒOPATHIC TREATMENT OF TOOTHACHE FROM PULP-CAPPING.

BY CHARLES H. TAFT, D.M.D., CHICAGO, ILL.

THE interest which has been awakened in the homœopathic treatment of cases occurring in the every-day practice of the dentist, as manifested by the numerous letters I have received requesting such information as I could give and which would enable others to pursue a line of study intelligently, with the end in view of having at command, if nothing more, an effectual method of quickly relieving the various kinds of toothache, from causes with which we are all more or less familiar, prompts me to relate a recent case in practice, and to suggest some of the indications which furnish a key-note for the remedy given.

As a preface to the subject I have chosen, I may say that in recent papers I have dwelt at some length upon the philosophy of the homœopathic law of cure, and have suggested the work entitled "Hering's Domestic Physician," with its chapter upon the affections of the teeth, as furnishing, to me at least, an invaluable aid for the treatment of many cases where the ordinary dental therapeutic agents at our command have proved either wholly unsatisfactory or unsuccessful.

It gives me pleasure to know that many others in our profession are working along the lines I have suggested, although none can appreciate more fully than myself how greatly one is handicapped in such study and its practical application by those who have had the advantages of a thorough medical training.

A complete mastery of the art of healing or the ability to relieve human suffering, even when based upon a simple and well-established law, is not to be acquired in a day, if indeed in a lifetime; but to the earnest and thoughtful student, neophyte though he be, there is a fascination in the study of this law and the manifestations of its operation which cannot fail to urge one on to still greater effort, when once such study has been entered upon free from all partisan prejudice and with the simple desire to find the truth.

I am well aware that many practitioners make it a practice never to cap an exposed pulp, even though the pulp is a freshly exposed one and devoid of any inflammation or irritation from whatever cause, but deem it best to destroy it at once. My own

experience in any case is to destroy it only when I am confident its vitality cannot be successfully restored and maintained without giving the patient future and continual annoyance; for I am of the opinion that a live tooth, like any other organ, is an infinitely better member of the economy than is one in which such vitality has been destroyed, and especially if the tooth happens to be one of the incisors or bicuspid. But this is simply an individual opinion, based upon experience and a careful treatment of such cases.

The following case in practice is intended to furnish one of the many reasons for such belief, and to suggest such therapeutic treatment as a similar emergency may demand.

On March 16, Mr. F., aged thirty-two, came to my office for a series of appointments. The rubber dam was adjusted, a large corono-distal cavity in the right superior second bicuspid and another in the corono-mesial surface of the right superior first molar were carefully excavated, but not without avoiding an exposure of the pulp in the molar, and perilously near one in the bicuspid. Both teeth were exquisitely sensitive to the touch of an excavator, but had never given the patient the slightest discomfort. The exposed pulp was capped according to the method I invariably employ, by applying oil of clove to the pulp and dusting over it a sufficient amount of dry oxide of zinc. The same precaution was taken with the bicuspid, and both cavities were then filled with oxyphosphate cement, mixed to the proper consistency. The operation finished, the rubber dam was removed; the patient said he felt no pain nor discomfort from the fillings, and, rinsing out the mouth, was about to leave the chair, when he seized his head with both hands and cried aloud with pain.

The pain continued for several minutes, coming in terrific paroxysms of but a few seconds apart, with determination of blood to the head and face. Becoming well-nigh frantic with pain, he implored me to extract the tooth at once and in no uncertain tone, saying that he simply could not and would not stand it.

There were but two or three expedients,—the first, to comply with his imperative command; the second, to remove the filling and apply arsenous acid; and the third, to give the one, and only one, plainly indicated homœopathic remedy which the symptoms called for.

Watching his symptoms for a few moments, I decided upon the last expedient, and placed upon his tongue a few pellets of the potentized chamomilla and waited for its effect.

Between the paroxysms he asked what I had given him, and,

contrary to my usual custom of naming the drug, I said it was chamomilla.

With a good knowledge of drugs on his part, being himself in the wholesale drug business, he remarked, with no apparent confidence in me or the remedy, that if chamomilla stopped such suffering as his it would be the first time he ever heard of its so doing. He added, however, before he left the office, that he was open to conviction.

As I stood by the chair, watching him in his writhing, I felt sure I had made no mistake in the selection of the remedy, and that, like an arrow from the bow, it would go straight to the mark. Within five minutes his writhing ceased, and the pain melted away like dew before the sun; his face began quickly to assume its normal color, and the paroxysms only recurred at long intervals and with decreasing severity during the next fifteen minutes, until they ceased entirely. He remained an hour after the medicine had taken effect, fully expecting the pain to return and to compel me to extract the tooth, but the latter was obstinate and positively refused to ache. Finally he left the office, with the assurance from me that in all probability there would be no recurrence of pain, and with an equally strong assurance and belief on his part that he would have to hunt up a dentist in the middle of the night and have him extract the tooth.

What, then, was accomplished in this case? for I am prompted to speak of it for the reason that never but once before in a practice covering a period of eight years do I remember seeing a case where the limit to physical endurance of pain was put to so severe a test. First, the pain was quickly brought under control and then banished entirely without the use of morphine, narcotics, palliatives, or counter-irritants, and without resorting to extraction.

Secondly, the vitality of the tooth is maintained, and, without some future manifestations of discomfort of, let us say, *improbable* occurrence (for the reason that the tooth had never ached, the exposure being a perfectly healthy one, and the capping one of absolute non-irritating substance, under normal conditions), is likely, I believe, from observation and experience with similar cases, to be maintained indefinitely.

Thirdly, the satisfaction which comes from a knowledge of what particular drugs to employ in any given case, and the ability to see, after a careful study of the law of similars and its operation, just *why* chamomilla, for instance, would relieve one kind of toothache and be entirely inoperative or ineffectual in another kind. In other

words, recognition of the fact that there can never be any one drug which would act as a specific for all kinds of toothache.

Up to the present writing, during which time the patient has had several subsequent sittings, there has been not the slightest recurrence of pain or discomfort.

Doubtless some sceptical friend will venture the remark that the cessation of pain was not due to the medicine, but ceased of its own accord. Another will probably suggest that I hypnotized him or the tooth. A third will emphatically assert it was not the medicine, for how could attenuated "moonshine" effect so complete a relief? While a fourth will incline to the belief that I employed the methods of the Christian Scientist, and assured him that his suffering was simply a delusion and did not really exist.

To all such my statement will undoubtedly be of little interest or help in similar cases, but to those who are interested in the action of drugs and the laws which govern it, so far as it concerns us in our every-day practice, the paper is especially addressed, with a view to pointing out the fact that one of the strongest indications of chamomilla for the relief of a toothache like the one described is the fact of its driving the patients so nearly *frantic* with pain that it is difficult for them to speak a pleasant word, or in a pleasant tone of voice. In a word, are thoroughly *ugly*.

In striking contrast to the always jovial, happy-go-lucky disposition of the patient was his manner and language towards me during those first fifteen minutes after the operation. That and the sudden rush of blood to the cheeks were two of the strongest indications pointing to chamomilla in preference to other drugs having equally strong indications in other cases, but which, being not homœopathic to the case in question, would have proved equally unavailing and unsuccessful.

Upon the ability to differentiate clearly and carefully between the symptoms in any given case like the above, which plainly point to one drug, and *only* one, depends the success of him who attempts to apply the art of dental medicine in strict accordance with the law of similars.

It was Samuel Hahnemann who said,—

"When we have to do with an art whose end is the saving of human life, any neglect to make ourselves thorough masters of it becomes a crime."

When we, as dentists, have to do with an art one of whose ends is the alleviation of human suffering, should a neglect to make ourselves thorough masters of it become any the less a crime? The

question is one that may well command our thoughtful consideration, and must be answered by every man according to his own best judgment and with such methods as he alone has at his command.

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## THE DENTAL PULP, ABSCESSSES, AND ROOT-FILLING.

BY CHARLES KEYES, D.D.S., RIO DE JANEIRO, BRAZIL.

To destroy the dental pulp painlessly, take a disk made of No. 60 tin-foil, and cut to the size of bottom of cavity into which it is to go, and depress between end of excavator handle and a piece of soft wood, or rubber pad. Fill with campho-phénique, into which is placed sufficient aristol to make a syrupy mass; to this add two or three crystals of cocaine hydrochlorate, and in the centre of this little disk of paste put about a one-hundredth part of a grain of pure arsenic (white oxide of arsenicum). Dry the cavity (after having previously cleaned out and washed with warm water) and invert the disk and contents over the exposure and fill over with temporary stopping, being careful to avoid pressure sufficient to flatten the disk on the pulp.

Since the latter part of 1889 I have used almost exclusively this method, and I cannot record a single case which gave pain, unless inflammation existed in the pulp previously to the application.

For allaying inflammation in the pulp, extending to suppuration, with or without pain, I have found nothing more effective than *thymol*, which is applied pulverized in a tin disk inverted over exposure and cavity filled with temporary stopping, having previously cleaned the cavity and washed with warm water. If pain be very severe, a drop of chloroform placed in the cavity, after the disk with thymol is adjusted, and previous to putting in temporary stopping, will usually lessen pain; otherwise thymol generally requires from ten to fifteen minutes to produce effect. In slight cases one application is usually sufficient, but in severe ones sometimes several are necessary before arsenic may be applied.

To avoid pericementitis, abscess, etc., in the removal of putrescent pulps, exclude absolutely the entrance of saliva, use clean instruments, flood cavity with some good antiseptic, and at first sitting remove all of the pulp possible without letting any of the matter or the end of the broach pass beyond the apex. The patient should be told to give notice on first sign of sensation, as

the main point is to avoid, under all circumstances, the passage of anything into the tissues beyond the end of the root. This done, follow with loose dressing of campho-phénique containing about ten per cent. of aristol. If a second dressing be necessary, use oil of cassia with aristol in same proportion as above. Vapors of the former are less likely to produce irritation than those of the latter. In using peroxide of hydrogen, pyrozone, or natrium and kalium, care must be taken to keep the entrance to canals from clogging, else the gases set free may pass the other way and carry with them matter beyond the apex, which must be avoided.

To treat abscess without fistula ("blind abscess"): After the canals have been thoroughly freed from septic matter, pump into the abscess campho-phénique, with ten per cent. aristol, until the patient can feel it, leaving very loose dressing in the root with only sufficient cotton to keep out food (pure aristol incorporated into cotton anywhere exposed in the mouth will keep it "sweet" much longer). Subsequent treatment consists in keeping the canal clean and aseptic, with loose dressings, until no more pus can be found in the canal. Much trouble is frequently caused by over-treatment.

If hydrogen peroxide be used to clean out the canal and abscess, care must be taken not to allow the apex to become clogged.

For filling root-canals: Take of oxide of zinc and aristol equal parts, and oil of cassia and vaseline enough to make a soft, putty-like paste. After the canal or canals are thoroughly dried, fill the pulp-chamber with this paste, and with a hot instrument, or nerve broach with wisp of cotton wrapped around it, work into place. After the canal is filled with this mass, a gutta-percha cone, the size to fit the case, is pressed into the canal, the surplus being removed with a hot instrument. The balance of the pulp cavity is filled with any of the cements.

I have used this paste alone in filling roots of temporary teeth, and subsequently, after roots were absorbed, extracted them and found the paste, though much harder and tougher, perfectly intact, and protruding a little, somewhat like crabs' eyes. In no instance have I found any irritation caused by this paste, which I have used constantly for over three years.

## FURTHER REMARKS ON PYORRHŒA ALVEOLARIS.<sup>1</sup>

BY C. N. PEIRCE, D.D.S., PHILADELPHIA.

IN two previous communications, one published in the *INTERNATIONAL DENTAL JOURNAL* for January, 1894, the other in the *Dental Cosmos* for February, 1894, there are stated, with some detail, views which I entertain, and which appear to me to be sustained by recent experience, regarding the etiology, pathology, and treatment of pyorrhœa alveolaris.

In these two papers facts and deductions are presented which, if rightly interpreted, it is believed will establish the kinship of pyorrhœa, or as previously designated, hæmatogenic pericementitis, with the gouty or uric-acid diathesis.

The conclusions entertained may be well represented in a condensed form in the following postulates,—viz.:

1. The inflammatory stage of true pyorrhœa alveolaris primarily begins in tissues on the side of the root near the apical extremity, and secondarily advances in the very large majority of cases towards the gingival borders.

2. The cause of this inflammation, or gingivitis and pericementitis, is the plasma exudation from the blood-vessels freighted with salts, which, in their deposition and crystalization upon the cementum of the root and infiltration of the more vascular tissues, exert the influence of foreign bodies and react as irritants.

3. The salts in question, as disclosed by chemical analysis, are calcium and sodium urates, free uric acid, and calcium phosphate.

4. The chemical nature of these salts indicates a condition of the blood in which there is an excess of uratic salts and uric acid, due to either *increased formation* or *imperfect elimination*. The excess of these salts, as is well known, is regarded by general pathologists as indicative of a faulty nutrition, and is the immediate cause of a series of local disturbances to which the term gouty has been applied, the nutritional disturbance being known as the uric-acid diathesis.

5. An attentive study and accurate observation of the various organs and tissues of patients suffering with pyorrhœa alveolaris have disclosed the co-existence, in a very large proportion of them, of one or more local expressions of this constitutional diathesis.

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<sup>1</sup> Read before the Odontological Society of Pennsylvania, March 10, 1894.

6. Recognition of the fact that a constitutional malady presents itself, one phase of which only has claimed the attention of the dental practitioner, indicates that a treatment designed to be curative must have reference not only to the local expression, but especially to this important systemic condition as well.

7. Results from constitutional treatment in connection with the usual local applications in a number of well authenticated cases of pyorrhœa have been so markedly satisfactory that the writer feels fully justified in his assumptions regarding the origin of the disease.

An objection that might be and, indeed, has already been urged to these conclusions is, that while some of the cases of pyorrhœa might be considered as either the local expressions of a constitutional condition, or the sequence of a specific poison acting as a predisposing cause, yet a large percentage, it is claimed, cannot be so estimated. *The force of this objection must depend entirely upon what conditions are meant to be represented by the term pyorrhœa alveolaris.*

In a former communication an attempt was made to differentiate two distinct diseases of the pericemental membrane, both of which were caused by the deposition of salts. In this short paper I desire to recognize the fact that we have *three* distinct conditions, quite easily differentiated, which it appears are not infrequently—indeed, are generally—classed under the same heading, "Pyorrhœa Alveolaris." The *first* may be noted as inflammation and destruction of the gum-tissue and the pericemental membrane, with solution of the alveolar process,—this the result of a mechanical irritant, the salivary calculus. This may or may not be accompanied by a flow of pus. If the pus be present, it is dependent upon some constitutional predisposition such as a scorbutic or scrofula habit. *Second.* Inflammation of the gingival borders with a varying flow of pus, but without the presence of tartar,—phagedenic gingivitis and pericementitis,—so designated by Dr. Black. This is greatly exalted, if not wholly caused, by some morbid constitutional state, which is also a destructive process. *Third.* Alveolo-cemental irritation originating at or near the apical extremity of the root, and due to some morbid composite of the blood exuded with the plasma, a salt or salts, infiltrating this locality of the membrane and *usually* becoming precipitated upon the root of the tooth near the apex; this latter I designate true pyorrhœa alveolaris, or hæmatogenic pericementitis. It is accompanied by accumulation and flow of pus, by denudation of a portion, or all, of the root, by dissolution of the process, by turgescence of the gum, and



in certain stages with considerable pain. This inflammatory condition, with its concomitants, being so invariably associated with some recognized manifestation of a gouty diathesis, there appears to be full warrant for stating that it is but another local expression of that systemic condition. Confirmation of this assumption is found in the fact that this accumulation which is so frequently recognized upon the root near its apical extremity has by analysis been proved to consist of such foreign bodies as sodic urate, calcic urate, and free uric-acid crystals. Nor is the presence of these salts the only evidence of the correctness of this theory. Cases which have been locally treated for months, indeed for years, with only a very limited perceptible improvement, have, when the patient has been subjected to constitutional treatment in addition, responded promptly; the inflammatory conditions, with their progressive concomitants, pus and process absorption, subsiding in a great degree. It is a matter of almost daily occurrence and observation, that a chronic latent inflammation of the pericementum may undergo an exacerbation from mechanical or atmospherical causes from the accumulation of the product of decomposition in the tooth, which may be followed by the formation of pus. This form of pericementitis may be of long or short duration, but in most every instance it yields promptly to local treatment. Now, although this inflammation be attended with a flow of pus and much suffering, it is in no wise a specific inflammation, and frequently occurs in individuals in whom no trace of a gouty tendency could be detected. And when the train of symptoms of such an inflammation are contrasted with those of the disease with which all are familiar, and which is known, or has been known, as Riggs's disease and *pyorrhœa alveolaris*, there can be no doubt that two distinct conditions are to be diagnosticated and treated. It is conceivable, however, that a local, non-specific, easily controlled pericementitis might, by the deposition of uric acid, become a specific, persisting, and destructive pericementitis. It is then this phase of the disease, whether *primary* or *secondary*, to which is applied the term hæmatogenic, and which is to be regarded as a local manifestation of a constitutional condition.

In the remaining moments devoted to this paper an effort will be made to outline a course of treatment based wholly on the supposition that in its etiology and pathology *pyorrhœa* as above defined is but one of the multiform phases of the uric-acid diathesis. This, then, very naturally resolves itself into both local and constitutional treatment; the local directed towards the removal of the

deposit, and the control or suppression of the inflammation and its concomitants. The method by which this is accomplished has been so frequently described and discussed that further amplification of it in this place seems unnecessary. There is, however, one factor which might be regarded as protective or prophylactic, and, though local, is of considerable moment and deserving of more than a passing notice,—I allude to the exercise of care in the avoidance of injuries to the pericemental membrane. Whatever the predisposing cause may be, the immediate or exciting cause must ever be borne in mind. This, it is believed, to a certain extent at least, is found in all those mechanical agencies so well known to the dentist, which impair or lower the nutritional level of the pericementum, thus rendering it liable, under certain systemic conditions, to a deposition of uratic salts. The question has been raised as to why the membrane of one or more teeth widely separated or occupying positions on opposite sides of the mouth, either simultaneously or successively, become the seat of inflammation when there is no continuity of structure; the answer to this must be found in the fact that impaired nutrition and lowered vitality in such structures are due in the majority of instances to mechanical injury. It is certainly within the experience of many observant dentists that pyorrhœa has not infrequently developed around a tooth after it has been subjected to the necessary mechanical manipulations incident to tooth protection—tooth preservation. This apparent interference with the nutrition of the pericemental membrane before the deposit of uric-acid salts takes place is in accordance with what is believed to hold true for other manifestations of the gouty diathesis. It is generally conceded by pathologists that no tissue becomes the seat of any specific inflammation without some previous alteration in its nutrition, which renders it more or less vulnerable to the morbid agent circulating in the blood. It is well known that this is especially true of acute gout. All the parts exposed to strain, pressure, blows, contusions, etc., such as the joints of the feet and hands, are particularly liable to become the seat of the specific deposit. As a prophylactic measure, therefore, it is suggested that whenever there is the slightest tendency to pyorrhœa, or any other evidence of the gouty diathesis, great care should be exercised in all dental operations, so as not to impair the nutrition of the peridontium and thus establish the necessary condition for the uric-acid deposit. The constitutional treatment which has been indicated as efficient in the elimination of already established uric-acid conditions, and the restoration of a faulty nutrition to its normal state, may with great

propriety be subdivided into hygienic and medicinal. The hygienic treatment embraces systematic out-door exercise, stimulation of the functional activity of the excretory organs, such as the skin, bowels, and kidneys, and regulation of the diet. Every dentist must appreciate the value of open air exercise, and if the welfare of the patient is to be considered paramount, it must be insisted upon in all well-marked cases, and especially with those who, for various reasons, lead sedentary and inactive lives.

Increased muscular activity quickens circulation, induces deeper and fuller respiratory movements, leads to greater vigor in the general nutritive processes; waste products are removed more rapidly, and the combustion of the foods increased by the absorption of a large amount of oxygen. The promotion of the functional activity of the eliminating organs is well recognized as an important hygienic measure.

My friend, Professor Brubaker, suggests that where there is need of hygienic treatment the secretory function of the perspiratory and sebaceous glands and the capillary circulation should all be stimulated by sponging of the skin with cold water, vigorous friction, and an occasional Turkish bath, where such treatment is not contraindicated by pulmonary or cardiac affections. And that where the liver and intestinal glands are deficient in secretion with prevailing constipation, they should be stimulated into activity by the use of saline waters; most excellent for this purpose being the Hunyadi Janos and Friedrickehalle. These, he says, are especially to be commended because they contain a large percentage of sodium and magnesium sulphates, both of which are useful as eliminating agents. The kidneys should be assisted in the excretion of waste products by the free use of negative waters, or waters in which the saline constituents are at a minimum quantity. Hot or distilled water in sufficient quantity will flush the alimentary canal, increase the volume of blood, and stimulate the kidneys to increased activity. It is not only of common observation, but rather a remarkable fact, that gouty patients are inclined to drink but a comparatively small quantity of water. One quart of hot water taken daily, in four doses, before breakfast, between meals, and at bed time, is considered most beneficial in its effects in dissolving and removing irritating products. The most important of the hygienic measures in the treatment of all gouty manifestations is that pertaining to the diet. As uric acid is considered a nitrogenized compound, and therefore presumably one of the imperfectly oxidized products of albuminous or nitrogenized foods, it is desirable that such foods be excluded as

far as possible from the daily diet. The value of this measure is admitted and insisted upon by all clinicians.

In the milder manifestations of the gouty diathesis, such as we assume exists in pyorrhœa, it is not so imperative that all albuminous foods be prohibited; nevertheless, as many of our patients are consumers of large quantities of meat, it would be well to insist, if the effort to cure is to be made, upon the total exclusion of beef, veal, mutton, and pork, restricting the patient in albuminous diet to white meat of chicken, fish, oysters, and lobsters. Cheese, beans, and the white of eggs are considered objectionable, and in many cases of acute gout are strictly prohibited by the attending physician. Experience has shown that various alcoholic drinks, such as port, madeira, and sherry, are particularly liable to give rise to the accumulation of uric acid. The lighter wines, as claret and hock, are not considered so injurious. The malt liquors,—beer, ale, and porter,—are also, with many clinicians, considered in their influence gross offenders.

If this assumption regarding pyorrhœa alveolaris be correct, the following, also furnished me by Professor Brubaker, is pertinent and applicable: The medical and constitutional treatment—it is obvious—should be directed towards the elimination of uric acid and its compounds. For this purpose remedies which promote the formation of soluble and easily diffusible products which are readily eliminated by the kidneys are indicated. From time immemorial the alkalies and alkaline combinations have been used with marked success in the management of all phases of the gouty diathesis. The treatment of acute gout necessitates, of course, different or more vigorous remedies than those required for the subacute or chronic forms with which the dental practitioners will be called upon to deal. Of the various alkalies, lithium compounds—the citrate and carbonate—have been found best adapted to the milder phases of the disease. The form most easily to take is the compressed tablets containing five grains each of the citrate; one tablet three or four times daily will be found sufficient. Should this not agree with the patient, the potassium carbonate in ten-grain doses, in some simple bitter,—gentian or quassia water,—three or four times daily, can be substituted. A valuable adjunct to the medicinal treatment is the free use of alkaline waters, which assist in the elimination of waste products, though it is probable that the good effects attributed to these are largely due to the quantity of liquid consumed. The Saratoga, Vichy, alkaline waters of Wisconsin, the Marienbad, Carlsbad, Appolinaris, etc., have all been found effica-

cious. Should the patient be highly dyspeptic, as is frequently the case, remedies directed to the digestive viscera are of course indicated. If anæmia be a concomitant, iron and quinine will be necessary. A combination which has been found of great value in improving the quality of the blood is one of iron and a salt of potassium. Blaud's pill, consisting of these two ingredients, is a desirable form for administration; one three times a day will be sufficient. However ingenious our interpretation of pathological conditions may be, and however plausible our deductions may appear, the ultimate test of their value will be the readiness with which they yield to and disappear under appropriate treatment. If pyorrhœa alveolaris be a manifestation of the gouty diathesis, and the symptoms and pathological conditions which characterize it be excited and maintained by the deposit and pressure of uric acid and its salts, it should be amenable to the same therapeutic measures which have been efficacious in the treatment of all other forms of gout in other portions of the body. It must be borne in mind, however, that though a case be cured for a period of six months, or even a year, this does not preclude a relapse should the patient return to an improper diet or irregular mode of life. It is hardly necessary to say that this is true of all chronic diseases. In individuals predisposed to uric-acid accumulations, an entirely new mode of life is to be instituted and followed with extreme care for a long period of time.

As corroborative, however, of the facts which have been adduced in this and previous papers, in relation to age, occupation, heredity, constitutional condition, as well as the effects of treatment, I append the history of a few cases which may be of interest.

CASE I.—Mr. A., aged forty-five. Family history: father died early from consumption; mother rheumatic; has lost nearly all her molars from pyorrhœa, which she has had for many years. The patient has been suffering from pyorrhœa for six or eight years. For nearly three years he has been under my care, his visits being monthly. Though not a tooth has been lost, the thirty-two have been the seat of well-defined pyorrhœa; gums œdematous, with veins engorged, giving a purplish color. Notwithstanding the continued local treatment, the most that can be said as to the benefit derived from this is, that the disease did not progress, nor did it materially improve, save some abatement in the inflammatory condition of the gums. As an evidence of a gouty constitution the patient had suffered with neuralgic headaches, vague rheumatic pains, and great mental depression. Several years ago he was informed by a distinguished clinician that the heart was depressed in

its action from nitrogenized waste products. The patient admitted having largely confined his diet to meats. After, now, a little over three months' treatment, embracing restricted diet and the use of lithium and hot water, the discharge of pus has ceased from all the teeth except one third molar. The loosened teeth have become much firmer, the turgid condition of the gums has disappeared, and the gingival borders present a much more normal appearance. The patient on his last visit stated that mastication was performed without fear of dislodging the teeth.

CASE II.—Mrs. B., aged fifty-five. Family history, gouty; one sister almost disabled from deposits in joints of hands, feet, and limbs; another sister has lost by erosion the enamel from the six anterior superior teeth. The patient has had pyorrhœa for eight or ten years, from which several teeth have been lost; ten others are now affected with looseness and some discharge of pus. The members of this family have been large consumers of meat. Treatment for two months with drinking hot water and modified diet gave improvement in flow of pus and inflammatory condition of gums.

CASE III.—Mrs. C. Lost superior teeth from pyorrhœa; ten teeth remaining in lower jaw, all more or less affected with pyorrhœa. The patient has been under treatment for gout for some years,—all the joints of fingers enlarged and painful from gouty deposits. The forehead and face show the result of herpes from previous herpetic eruption, regarded as of gouty origin. Treatment was followed by improvement.

Without wearying you with details of similar cases, permit me to say that in addition to the three cases just noted, ten others have been, and are, under treatment, all of whom, with the exception of three school-teachers, have presented other manifestations of gout. In these three cases a sedentary life and concentrated nitrogenous food have probably been instrumental in establishing the systemic condition leading to pyorrhœa. It is gratifying to recognize the fact that cases which have been brought under treatment of the restricted diet and the indicated constitutional treatment have given such encouragement that it is not unreasonable to hope that, with a continuation of the therapeutic measures and careful diet, the not-distant future will witness such abatement of the destructive symptoms that the cases can, with few exceptions, be recorded as confirmatory of the theory suggested in the foregoing papers.

The writer can certainly state that the local treatment alone which had previously been employed by him has not yielded such satisfactory results.

## A REPLY TO DR. KIRK'S ARTICLE ON COAGULATION.

BY MAX GREENBAUM, D.D.S., PHILADELPHIA.

IN order that we may arrive at a just conclusion in a controversy, each side presents its testimony and permits counter-criticisms being passed upon it. If one side present a faulty argument, it is proper that the other side should point it out. If there be any misconceptions, they should be set aright. In this way generally we glean the truth and arrive at the common point of harmony in practice. Dr. Kirk, in his article "Coagulants in the Treatment of the Pulp-Chamber and Canals," criticises the views of those who maintain that coagulating applications are detrimental in pulpless teeth as being "mere assumptions" and "serious errors in reasoning," and as a warrant for such criticisms presents a series of experiments. Now, that is a very fair way of proceeding. But if the warrant lack validity, and, furthermore, if the views antagonized have been stated but partially conceived, why, then it is natural that those who have been criticised should desire the presentation of their testimony.

That Dr. Kirk should have assumed that all who refrain from the use of coagulants in the treatment of the root-canal do so because the formed coagulum presents a barrier to any further diffusion of the coagulating application, or any other subsequent application, and that Dr. Harlan was the originator or, at least, the chief exponent of such views, is, to say the least, but a very partial statement, and one that reflects quite seriously upon his understanding of the question.

With some, and they seem to be a large number, the question is not simply whether the coagulating application is a barrier to its own diffusion, but as Dr. Kirk has acknowledged in many instances where canal work is in operation, "nothing can be taken out and nothing can be put in;" and if he feels that his experiments have done anything in the way of disproving "those assumptions" and "serious errors in reasoning," of which he thinks Dr. Harlan is the originator or, at least, chief exponent, we cannot see it in that way.

Dr. Kirk is not thoroughly acquainted with the teachings upon this subject, otherwise Dr. Harlan never would have been placed in the unenviable position of originator or chief exponent. The use of such irritating coagulants as Dr. Kirk mentions in his experiments

have been discarded by many in the treatment of the canal for the last twenty-five years, and twenty-five years carry us back farther than 1887.

But, aside from this, he commits himself more seriously, which further sustains our objections.

Dr. Kirk remarks, "The statement of different writers and speakers upon dental therapeutics, to the effect that medicaments which possess the property of forming a coagulum with albuminous organic matter should be excluded from the treatment of pulpless teeth." Now, if he thinks such statement represents the views of those whom he is antagonizing, he may learn otherwise. It is by no means a question of excluding such medicaments as possess the property of forming a coagulum with albuminous matter, and the essayist commits himself in the making of such a statement. The question is, of excluding *irritating coagulants*. Many who refrain from the use of carbolic acid in canal work find in campho-phénique probably one of the best medicaments in the treatment of pulpless teeth, and yet campho-phénique will coagulate albumen.

Then, again, Dr. Kirk remarks, "That the able researches of Professor Miller and Professor Black have thrown so much light upon the antiseptic value of a number of substances which are devoid of coagulating property, and which it has been proposed to utilize instead of coagulants in pulp-canal treatment." Now, if Dr. Kirk believes that such medicaments have been recommended too freely and frequently,—although, very wisely, he fails to mention just what medicaments these are,—it may be well to state that many whom he is criticising recommend coagulating applications in canal work, but that they recognize the *difference* in the coagulation produced between the medicaments which they approve and disapprove, which Dr. Kirk apparently does not seem to know. These facts, taken together, strengthen the observation, to say the least, that he has but partially conceived the views which he regards as "mere assumptions" and "serious errors in reasoning." This rightly questions the strength of his entire arguments. But we may go further, and observe that, even though his conceptions had been complete of the views he is antagonizing, his experiments give him no warrant for any antagonism. In other words, they have nothing to do with what is antagonized; or if he should insist they had, then he commits himself to other serious difficulties, which we shall observe later.

The essayist undertook a series of experiments obviously for the purpose of demonstrating that coagulating applications do not act



detrimentally in canals, aside from the fact that many whom he is criticising never assumed such position, as was observed in the use of campho-phénique. Let us say he confines his criticism to those who object to *irritating* medicaments, as carbolic acid or zinc chloride. If his experiments prove, then, that such medicaments do not act detrimentally, they also disprove that which is held by a number of practitioners, that irritating coagulants are detrimental in canal work.

In order to understand the side of the question intended to be disproved, we must have a complete interpretation of it, and that is, when irritating coagulants are employed in canal work, they effect the tissue surrounding the canal, in many cases, but partially, nor have we the warrant for saying that any application acts thoroughly in any case; and this is owing to the minuteness and irregular shapes of a great number of canals; and no application can be worked so well, nor do the conditions under which we work admit of the necessary exactitude that we could say of it, *it has done the work*; and therefore, as a great number of cases admit of no treatment, and others of but partial treatment, and as we have no warrant for saying that any case is thoroughly treated, so have we the right to anticipate future irritation, and this irritation is made more formidable by the use of irritating coagulants.

As Dr. Kirk attempts to disprove that question, what has he done to show this? Nothing. If certain views are to be controverted through means of experiments, those experiments should embrace all the conditions included in that which is to be controverted. His experiments upon the result of which he basis his antagonism certainly do not show this. What they do is, to make clear a degree of insufficiency, which is far from what is necessary to sustain his criticism.

In order to make his argument tenable, he must proceed in one of two ways. He must demonstrate the views of those who maintain that a great many canals cannot be treated at all, and that a large number can only be treated partially, as being erroneous, or else that he can proceed in a manner, in the treatment of canals, that insures the desired tissue to be effected at every point, and not a point farther; and, moreover, that this can be done every time. Had the doctor selected a tooth in the jaw for canal treatment, and made an application of carbolic acid or zinc chloride, and could determine the requisite quantity to be applied that would insure this result, and then extracted the tooth so treated, and demonstrated that to have been done, then the experiment would have force.

But instead he proceeded quite differently. He took teeth out of the mouth, drilled an opening into the pulp-chamber, and in this fitted a glass tube. The end of the root is sealed. Into the tube a quantity of zinc chloride is poured, and the root surrounded with egg albumen. After a time the observation is made that the zinc chloride effects the albumen on the outside, and from this the attempt is made to prove one side of the controversy and disprove the other.

It is evident that in these experiments the conditions have not been observed to offer any positive or reliable basis for any antagonism or criticism to those views of which, Dr. Kirk says, Dr. Harlan is the originator or chief exponent.

It is curious to observe in his experiments that in proportion as any point appears valuable, so is there no confirmation of it. He states the objection to coagulants in canals to be a twofold one (meaning irritating coagulants). In the first place, such application seals the ends of the tubes, thus preventing the further entrance of any coagulant or antiseptic, and also of enclosing within a certain quantity of infected organic matter, which may, by its decomposition act subsequently as an irritant to the pericemental membrane. Later on he admits that he is unable to say whether coagulation invariably means sterilization.

Now, suppose we admit that the use of carbolic acid in canal work brings about entire coagulation, which fact, however, Dr. Kirk or no one else has ever shown, unless the point is that coagulation means sterilization, we fail to see any advantage in its use. But, on the other hand, such application may be disadvantageous should any decomposition arise.

Dr. Kirk answers himself when he quotes the following significant remarks of Dr. Atkinson: "He must go a little deeper and nominate the changes that occur between the food product and the chemical product,—that is, the result of the changes made by bringing the various substances together. There are affinities resident in the primal elements that have to be satisfied to bring about the changes we have recognized. We have not recognized the true theory so as to get at the alphabet of the molecular changes when we are considering the results as we deal with diseased tissue." In the application to the canal of such coagulant as espoused by Dr. Kirk, the first effect would be to coagulate a certain portion of the dentine, so much and no more, and after that it would not be a question of osmotic action.

Supposing, now, repeated applications are made, and they fulfil

the condition of osmotic action. In what manner could we determine just how much of the surrounding structure became coagulated, or, in other words, even though applications to the canal act upon the principle of osmotic action, what, then, should prevent the cemented structure from being effected, and, in being effected, act as an irritant that might eventually prove very serious? Osmosis, then, which he takes particular care to emphasize, has nothing to do with the matter at hand, nor can we say that osmotic action takes place in the canal when in position in the mouth, because the conditions are entirely dissimilar to his experiments; and, finally, even should we establish osmosis, it is fraught with serious consequences.

Dr. Kirk once more quotes Dr. Atkinson. In a discussion concerning Dr. Harlan's paper, in which it appears the statement was made "that anything that will coagulate albumen is not fit to be used in the treatment of the root canal;" to which Dr. Atkinson replied that "chloride of zinc has repeatedly been introduced to preserve exposed pulps that has converted the entire pulp throughout the length of the canal into a hyaline coagulum that has proved just as good a filling as can be, and has stood from year to year, and without coloring the teeth or giving any indication of retrogressive movement whatever." If Dr. Kirk offers this in confirmation of his conclusions, it is very strange indeed. Strange, because he is very particular in admitting evidence, and strange that any one should apply chloride of zinc to an exposed pulp for its preservation.

Dr. Kirk advances upon a recruit to the army of "non-coagulants" which he is attacking, in the person of Dr. Ritter, of Utica, N. Y., although Dr. Ritter appears to be but half a recruit. Dr. Kirk finds fault with Dr. Ritter's procedure because that gentleman uses zinc chloride only in cases where the canals have been cleansed previously by a saponifying agent and *where the canal is large enough to permit of its successful working*. Now, he may permit us to say that is just the point precisely, "*where the canal is large enough to permit of its successful working*," and he must establish the fact that irritating coagulants produce the result in dental work implied by his experiments in osmotic action, and not permit experiments in osmotic action to establish anything in the way of the action of irritating coagulants in pulpless teeth in the mouth.

The statement that the use of such coagulants as carbolic acid and zinc chloride has not only overwhelming clinical evidence in its favor, but that it is actually proper on theoretical grounds and fully in accord with the laws of osmosis, can be doubted with

greater reason than it can be accepted. Particularly does this appear so from his experiments, and not only is the evidence overwhelming against the use of such coagulants, but the theoretical grounds, as well as the laws of osmosis, as far, at any rate, as his experiments relate, do not advance the question. Their coagulating property in a great number of pulp-canals can be urged scientifically against their use, and if the laws of osmosis can elucidate the problem, the experiments do not indicate it.

Dr. Kirk steps aside somewhat from the issues of his paper when he quotes some one concerning our educational methods. If he extends that as a hard thrust to any of his fellow practitioners, he may have overlooked the fact that it strikes just as hard home; and if he feels that our system of education is principally a process of mental stuffing, and that it is of far higher value to criticise evidence than accept all that is taught, and that much of what is taught is as yet an open question and accepted too blindly upon authority, it is equally as faulty to institute experiments that do not "demonstrate," and to accept such proceedings in any manner that carries the remotest sense of conviction with it.

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## Reports of Society Meetings.

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### AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, on Wednesday evening, April 4, at six o'clock, President Smith in the chair.

A paper by Dr. J. W. Farlow—subject, "On some Relations of Diseases of the Nose and Throat to Dentistry"—was then read.

(For Dr. Farlow's paper, see page 491.)

#### DISCUSSION.

*Dr. Eames.*—I probably express the gratitude of all to the speaker of the evening for outlining in so simple and clear a manner the symptoms of adenoid disease.

My interest in this and allied subjects arises from the dental stand-point. I have endeavored to cover a field not wholly covered by the physician or the dentist,—a middle ground.

I am interested to find out the cause of this disease, and of the

relation of these adenoid growths to deformities of the dental arch and teeth. I may give it as my decided belief that the adenoid growth does not produce the deformed palate, but that they are concomitants and have a common cause. I have two patients, who came to me at nearly the same time, with adenoid disease, and I should be pleased at any time to show you models of the cases, or the patients. One of them has irregular teeth and a contracted arch, while the other has what most of us would call a typical arch, wide, well formed, with teeth regular, but with more adenoid disease than the first case. These two cases represent extremes, as far as the palatal arch is concerned. It has been said that it is useless to correct irregularities of the teeth while there are adenoids present; but I have never seen proof of this, and I do not believe it is true. I have seen one case, at least, in which the arch was expanded and teeth regulated before it was known that adenoids existed, and three years afterwards, when the growths were removed, there had been no return to the former condition. While I believe that the growths should be removed, and that at the earliest opportunity, I do not believe that the presence of adenoids and consequent mouth-breathing produce a contracted arch.

*Dr. Fillebrown.*—I would like to ask Dr. Farlow in how large a proportion of cases does the high arch accompany the adenoids? Or, to put it the other way, how frequently do you find adenoids with a normal arch?

*Dr. Farlow.*—Very infrequently, except in adults, and that to a limited extent. It is possible that adenoid disease can begin at a time when the jaw has very nearly reached its full growth, and in such cases the teeth, holding their positions firmly, often deceive one into thinking that there is no adenoid present. I have a young lady patient who is a good example of this class. She has a well-formed arch and a beautiful set of teeth, and yet there is considerable adenoid growth present, apparently starting from either measles or scarlet fever, or some other infantile disease which she did not contract until later than usual. This disease, whatever it was, produced some affection of the post-nasal space, and now the adenoid has become added to it. I think there are a number of such cases, but I should say that probably in seventy-five per cent. of the cases that I operate on in young children, where there is an obstructive growth in the post-nasal space, there is also a high palate, looking like the imprint of a finger on putty.

*President Smith.*—With great narrowness between the bicuspid teeth and canines and overlapping of the incisors?

*Dr. Farlow.*—Yes.

*Dr. Fillebrown.*—What led me to ask my last question was the case of a young girl which came under my observation not long since. The only troublesome symptoms which she showed were frequent colds and a little obstruction in speaking. The arch was normal, the bicuspid being a little approximated, but not enough to need any attention. Examination proved the presence of adenoids. The patient had complained somewhat of difficulty of breathing through the nose, and the removal of the adenoids of course improved the respiration and helped the other symptoms that I speak of.

*Dr. Farlow.*—I believe there are some people who can overcome almost any obstruction. I have a young lady patient with rosy cheeks who is the picture of health, but the amount of adenoid growth is very considerable, and shows itself by very frequent colds and profuse secretion. We should bear in mind the size of the growth and the size of the space in which it is contained. It makes a great difference to the patient whether it is a small growth in a large place or a large, secreting, easily swelling growth in a place barely large enough to contain it.

Very often the growth atrophies at puberty, and the disease in adults is of a firmer, harder character than in children.

I have seen a few cases of high palate in children where no adenoid disease existed, and also a few cases of adenoid disease without the high palate, but in the vast majority of cases the two are associated, making it extremely probable that the deformity of the palate is caused by the nasal obstruction.

By many this deformity is attributed to thumb-sucking, but in the marked cases the nose is so obstructed that it is impossible to suck the thumb for any length of time.

*President Smith.*—The deformity produced in the jaw by the adenoid growth and that produced by thumb-sucking are entirely different. Thumb-sucking never produces a V-shaped arch.

*Dr. Farlow.*—There are men in your profession who think differently.

*President Smith.*—I know it, but they are wrong,—they confuse the two. With a V-shaped arch mesial surfaces of the central incisors come to a point like a plough, whereas in thumb-sucking or arm-sucking, the teeth span out. The two central incisors point out, giving the alveolar processes in front an inclination to spread rather than to come to a point, and forming a broad arch such as Dr. Eames has spoken of.

*Dr. Fillebrown.*—There is one more question I want to ask Dr. Farlow, and that is, How generally is the V-shaped arch dependent upon the presence of adenoids? In other words, how large a percentage of V-shaped arches do you find where there are no adenoids?

*Dr. Farlow.*—Very few, indeed. The only cases which I should be likely to see would be those who are troubled with some affection of the throat, and many cases must exist which do not come to the doctor's attention. But I see quite a number of cases where the palate is high and where there is a certain amount of irregularity of the tissue at the vault. Such are cases where adenoid disease has formerly existed and later has atrophied, so that they do not belong to the category of V-shaped palate independent of adenoid disease.

It is possible for the post-nasal hypertrophy to start up in young adult life and after the teeth and jaws are well developed, in which case the palate might not be deformed; but I should say that in more than seventy-five per cent. of the children on whom I have operated the palate was either somewhat V-shaped or high.

I have a patient on whom I am to operate in a few days. He has a broad flat arch, like the case that Dr. Eames spoke of. I found that he could breathe freely through the nose, and supposed, of course, there was no special post-nasal hypertrophy. Instead, however, there was quite a large secreting mass at the vault. One of his nostrils was very large, as was also the post-nasal space, so that he had good nasal respiration, even with a large amount of adenoid growth.

*Dr. Banfield.*—Would Dr. Farlow expect that in the case of a child exhibiting a catarrhal condition the removal of the adenoids would do away with it?

*Dr. Farlow.*—Yes; in very many cases. But the nose may also need treatment, and some of the worst forms of catarrh are associated with a condition of atrophy of the nose rather than hypertrophy, and have no connection with adenoid disease.

*Dr. Banfield.*—But may not that catarrhal condition be entirely due to the adenoid?

*Dr. Farlow.*—It certainly may, and removal of the post-nasal obstruction may rid the child of what was keeping the whole nose in an inflamed, congested, and secreting condition, and the establishment of ventilation and drainage may restore the nose to health.

*Dr. Williams.*—There is a point bearing on Dr. Farlow's idea

which I have heard suggested, and that is with regard to the effect of mouth-breathing in connection with adenoid disease in producing the V-shaped arch. The theory is that the deformity is partly due to the pressure of the muscles of the cheek. That is a theory which I think is very reasonable. When one opens the mouth widely he will notice a considerable strain on the muscles, and very likely that constant pressure in mouth-breathers would alter the shape of the jaw.

*Dr. Eames.*—I should most heartily dissent from the statement that the open mouth contracts the palatine arch, or that adenoid growths do it. I do believe, however, as has been said, that these are often found together; that in cases of contracted arch there is also usually a deformity of the nasal septum, and other deformities, but I do not believe that the mouth opened sufficiently wide to admit air for breathing presses upon the upper arch so as to draw it together. I think I can show by experiment at some future time just how much pressure is brought to bear on the side teeth by opening of the mouth.

*Dr. Williams.*—The condition is frequently illustrated in patients who find it difficult to brush the sides of the upper teeth owing to tenseness in muscles of the cheek. If the cheek is so tense as to prevent the brush from passing along the sides of the teeth, it is reasonable to suppose that, if put to an extra strain by the dropping of the jaw, this tenseness could gradually cause contraction of the jaw. Then, again, see how slight a pressure is required to move teeth. You see strong, firmly set teeth moved almost at will by a little wedge of inflamed gum.

*Dr. Eames.*—I would like to ask if it is not the ramus of the jaw that prevents a large tooth-brush, perhaps half an inch wide, from passing up along the sides of the teeth?

*Dr. Williams.*—Sometimes; but very often it is the pressure of the cheek against the teeth.

*Dr. Fillebrown.*—I think the obstruction you speak of is from the voluntary contraction of the muscles.

*Dr. Williams.*—No; it is from the simple dropping of the jaw, though the result is practically like a voluntary contraction.

*Dr. Eames.*—If you will just watch children and others when they are asleep with their mouths open, you will see that they open the mouth only a very little; the mouth simply drops open. There is not a tense condition of the muscles.

*Dr. Farlow.*—Many of the sufferers from adenoid disease have large tonsils also, and during sleep the tongue drops back and the



mouth is, of necessity, widely opened, so that it is not simply a case of relaxation of the jaws, but the effort to breathe and the snoring are very violent and can be heard throughout several stories of the house.

*President Smith.*—I am inclined to agree with Dr. Williams that the tension of the cheek muscles may have an influence in contracting the arch in early childhood, when the alveolar process of the upper jaw is soft. Of course we don't know how much resistance the bones of the upper jaw have, but we know this, that many children when they go to bed have a habit of simply opening the mouth and putting in their thumb or closing their mouth on their arm; there is no great force there, they merely rest their teeth in that position. Now, I know of a case where the incisors and alveolar process stand out very prominently, and it was caused by arm-sucking. There have been cases of deformities produced by children sucking their thumbs for only a short time, but long enough to produce a slight alteration in the line of the arch before the eruption of the teeth, and the teeth erupted in the abnormal line. Now, if such slight things as these produce deformities, it seems to me that extensive mouth-breathing would produce what we call the V-shaped arch. All V-shaped arches are not so caused, but the causes mentioned tend to produce this shape.

*Dr. Ainsworth.*—My experience in this line leads me to think that mouth-breathing is very largely the cause of narrow arches. The slight pressure caused by the strain of some of the forward muscles, as the orbicularis oris, rather than of the masseter or the buccinator muscles, is responsible for this.

There is another point which has not been referred to in describing the cause of the upper teeth not taking their proper position, and that is the lack of occlusion with the under teeth. When the mouth is closed the interlocking of the cusps guides the upper teeth into place, and that influence is largely lost where mouth-breathing exists to a considerable extent. I am very strongly inclined to side with the views of Dr. Williams and Dr. Smith.

*Dr. Banfield.*—Speaking of snoring, you know that is not entirely confined to children, and that older persons sometimes succeed in making themselves obnoxious to others without knowing it. I would like to ask if, in those cases, you would expect to find some growth as the cause of it?

*Dr. Farlow.*—No, indeed. That is not, by any means, the only cause of snoring. It may be due to a weak relaxed palate, or to obstruction in the nose itself, as from turbinated bones or deviations

of the septum; or it may exist where there is no obstruction to nasal respiration. Adenoid disease is not at all common after thirty to thirty-five years of age.

*Dr. Briggs.*—It seems to me that we do not put enough weight on the general vitality of the patient with reference to this obstruction, and that the results may not always express themselves in the same locality. If a patient has enough surplus vitality, he may overcome a great many of the ordinary symptoms; but if he has not surplus vitality, the result is bound to show itself somewhere,—it may not be in the mouth and jaws, it may be in the back. A child who does not breathe through the nose does not inflate the lungs to their fullest capacity; the lungs cannot be filled as full through the mouth as through the nose, and, therefore, all these things tend to affect the general development of the child, and are likely to result in some deformity. Where that malformation is depends upon circumstances, but you could expect in a child of poor vitality to find some evidence of poor development in some part of the body. I have a case in mind where adenoid disease has existed. The patient has no malformation about his mouth, has a good arch and a good palate, for at that particular point the natural development has established itself in spite of the adverse conditions. And yet, who is prepared to say that the double curvature which this patient has been suffering from may not be in part due to the impaired vitality resulting from the presence of the adenoid obstruction, as well as to the impairment of his vitality through his digestion, because of the immense mucous discharge that has been pouring down into his stomach.

*Dr. Banfield.*—I would like to ask Dr. Farlow if he finds among children who have adenoid growths a more irritable or nervous condition? I have thought that they were more nervous and more liable to certain forms of disease, such as colds, indigestion, or some diseases of a more nervous nature.

*Dr. Farlow.*—I have seen a large number of nervous phenomena caused by adenoid hypertrophy, such as chorea, twitching, general irritability, and one case of convulsions. If we pass a probe to the top of the post-nasal space, we often see reflex symptoms manifest themselves in various directions, as from this region nerves are given off which go to many and important structures.

I have seen cases where gentlemen of your profession have undertaken to straighten the teeth without removing the adenoids, and the children have been made so nervous that the dentists were unable to continue their work. You remember the case, Dr. Briggs,

of the Barker boy and sister, who became very nervous while wearing regulating appliances. That was a very marked case; any attempt at operation in the chair rendered them almost uncontrollable, producing a decided rise in temperature. After I had removed the adenoids and cleared the post-nasal space, Dr. Briggs was able to continue and to get a good jaw. I do not quite agree with Dr. Eames about that part of it.

*Dr. Eames.*—I agree fully with Dr. Farlow as to the necessity of removing the adenoids. It was not that the operator would not do all that he has said, or that I do not fully recommend such an operation; but I simply stated it as my belief that the presence of adenoids would not cause the return of any irregularity which had been corrected before their removal.

*Dr. Briggs.*—It seems to me that the point of impairment of vitality is not fully appreciated. I think Dr. Farlow will bear me out in saying that it has a great deal to do with the expression of symptoms. Every person whose health is impaired does not have the same expression of this impairment,—one has rheumatism, another has a cold in the head, and so on. And so in every child whose vitality is impaired the same conditions do not obtain. It all depends, then, upon the impaired condition of the general health of the patient, whether he exhibits the more pronounced symptoms of adenoid disease, or whether he simply does not breathe in a normal manner. We ought to know where the child is upset, for there may be matters of the general condition which may be changed almost instantly by the removal of these adenoid growths.

As to the statement that the teeth would return after correction while the adenoids were present, I think that would depend a good deal upon the development of the patient. If he is matured and you correct the teeth, even if you do not correct the adenoids, of course the teeth would remain as you left them. I do not think one would be expected to reason, as far as the adenoids are concerned, that the teeth would return if the operation were performed at that stage of development. The question comes, in the earlier years, when everything is soft and pliable, then you would not want to regulate before the adenoids were removed, as the same causes operating on teeth which have not yet reached a reasonable degree of firmness would be likely to produce the same results.

(Subject passed.)

*President Smith.*—Gentlemen, I now have the pleasure of introducing to you Dr. Douglas Graham, who will read a paper entitled

**"Massage in Rheumatism of the Temporo-Maxillary Articulation and Muscles of the Lower Jaw."**

(For Dr. Graham's paper, see page 487.)

DISCUSSION.

*Dr. Briggs.*—I am a great believer in massage, and I have had it employed in my family more or less with great benefit. The question of its application to the jaw has come to my notice in some cases with considerable benefit to the patient. I know that all of you have met with patients whose jaws snap in eating sometimes so bad as to be quite annoying to others at the table, and in the few cases that have come to me in my practice there has been an improvement, if not cure, by recommending such a person to go to a masseur or to massé the jaw himself. In that way the ligaments and the muscles have been toned up and improved. I have also had it suggested to me—I have never tried it yet—that a proper masséing of the gums, probably by the patient himself, was of great benefit in cases of passive congestion of the gums. For instance, in that sort of condition which we find in pyorrhœa alveolaris, it seems to produce a proper establishment of the circulation about the parts, and, therefore, an improvement of the general condition of the gums.

*Dr. Williams.*—For some years I have been in the habit of directing patients who complain of looseness or lameness of the jaw, sometimes snapping, sometimes not, but with difficulty of closing it regularly, caused by laxity in either the ligaments or muscles, or both, to take twice a day, morning and night, a towel wet in cold water and slap the face, and then take a dry portion of the towel and rub it briskly. That is, perhaps, combining the shower-bath with massage.

*Dr. Clapp.*—I would like to ask Dr. Graham if he thinks massage would be of any service in the acute stages of alveolar abscess. Dr. Briggs spoke of it in rather a different sense, but I was about to ask this question before Dr. Briggs spoke. In the early stages of threatened abscess, would this treatment assist in the distribution of the blood and thereby abort an abscess?

*Dr. Graham.*—I am afraid I do not know enough about dentistry to give a definite answer to that question; but in other parts of the body massage will sometimes abort the commencing inflammation about the joints, and if it were possible to apply it to the gum so as to bring about a better circulation, I do not see why it would not do it there.

*Dr. Banfield.*—I would agree with Dr. Briggs in the efficacy of massage in pyorrhœa. In a number of cases where I have advised treatment of this kind, there has been marked improvement and decrease in the amount of inflammation.

I would like to inquire of Dr. Graham if he thinks that this pain which patients complain of in the location of the maxillary articulation is due to a rheumatic condition? I have had a number of patients for whom it has been difficult to operate on account of great pain at the temporo-maxillary articulation. Are loose-jointed persons more apt to have rheumatic affections than others?

*Dr. Graham.*—One could not make out a clear diagnosis unless he got some symptoms of rheumatism in other parts of the body. I think loose-jointed people are more subject to rheumatic affections than others.

*Dr. Banfield.*—Does this pain that patients complain of in the articulating region come from the muscles or from the maxillary articulation?

*Dr. Graham.*—It may be either. I think one might be able to locate it, or get the patients to do so, either in the articulation or the muscles. They could probably tell you exactly where it is.

*Dr. Briggs.*—I would like to speak on the matter to which Dr. Banfield has referred, because I have treated it in a different way. I don't know that it is exactly a case for massage, except to relieve the pain for the time being. I have usually attributed it to ordinary cramp from the exercise of the muscles. I think you will find in cases where patients have so suffered that they, in a misguided way, have forced their mouths open to allow the dentist to operate, and it brings about muscular cramp; whereas, if a patient simply lets the mouth drop open, there is no extra tension on the muscles. I have a patient in mind. She is an adult person who had always suffered intensely when with the dentist in opening her mouth, and she now has no trouble, because I impress upon her the fact that she must not force her mouth open, but simply allow it to drop open, and that relieves her trouble entirely.

*Dr. Banfield.*—A few years ago I had a patient, a young man, whose jaw would slip out of its sockets from very slight pressure. While operating upon his teeth I would handle his jaw carefully and instruct him not to open it more than necessary; but occasionally he would find himself unable to close his jaw and would point to it for me to replace. He said he was obliged to deny himself a good hearty laugh, and was especially careful when in society.

*Dr. Williams.*—Was it a full dislocation?

*Dr. Banfield.*—Yes. The dislocation did not throw the jaw to one side, therefore it must have been a full dislocation.

*Dr. Williams.*—Was the patient in the habit of opening his mouth forcibly, or did he let his mouth drop open?

*Dr. Banfield.*—He tried to open it as naturally as possible, and did not open it more than was necessary.

*Dr. Williams.*—I say to my patients, "Let your jaw drop naturally, as if you were sleeping with your mouth open; do not make any effort." And I very seldom have any one complain of pain from opening the mouth.

*Dr. Potter.*—I would like to ask Dr. Graham about this snapping of the joints, whether he has used for it electricity,—the interrupted current,—and how that compares with massage? I know of its having been used in one case with a great deal of satisfaction.

*Dr. Graham.*—The interrupted current combined with massage works very nicely, and is better than either one alone. This current will relieve the pain so that patients snap the joints as much as they want to and think it great fun, and it does effect a cure.

WILLIAM H. POTTER, D.M.D.,  
*Editor American Academy of Dental Science.*

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#### HARVARD ODONTOLOGICAL SOCIETY.

At a regular meeting of the Harvard Odontological Society, held March 29, 1894, at Young's Hotel, Boston, President Eddy in the chair, a paper was read on "Some Observations on the Extraction of Teeth to prevent Decay," by Dr. Eugene H. Smith.

(For Dr. Smith's paper, see page 481.)

#### DISCUSSION.

*Dr. Werner.*—Mr. President, I know of no operation where it is more necessary to have clear perception and good judgment than in that which Dr. Smith has just described. Generally speaking, when there is a question of extraction the operator should possess clear judgment, because he is burning his bridges. In all the cases that the essayist has shown, it is evident that he has exhibited this clear conception. It certainly lessens decay, and it seems in almost every case to have improved the condition and position of the third molar, and that is very important. Many of our patients have an idea that the third molar is a very poor tooth, but we are all famil-

iar with that error, and in observing cases where the first molar has been extracted, one can readily see what a useful position the third molar occupies. The time of extraction also calls for good judgment. The only thing the models to my mind show, where the least adverse criticism can be applied, is in the considerable space left between the occluding surfaces of the teeth. Extraction, of course, destroys the continuity of grinding surface; but that, in a healthy mouth, is of much less consequence than extensive decay. However, in these models I do not know that I have anything to say against it, as they show that it was undoubtedly the wise thing to do. It has certainly helped to lessen the tendency towards decay, and also towards irregularity, and it has improved the condition and position of the third molar. Old Dr. Tucker is often spoken of as having said that it is better to have eight teeth in the mouth in good condition, than to have sixteen in poor condition. That is only expressing in strong terms the desirability of extraction in some cases.

*Dr. Cooke.*—Mr. President, I remember hearing Dr. Davis, of New Bedford, several years ago, take the ground that the extraction of the twelfth-year molars as soon as they came through prevented the decay between the teeth, and also gave the wisdom-tooth a chance to develop so that it would be of service. I would like to ask Dr. Smith what he thinks would be the result in a case where we are able to preserve the sixth-year molar and keep it in good condition,—whether he thinks it would be good practice to take out the four twelfth-year molars for the purpose of preventing this decay between the bicuspid and the sixth-year molars and the crowding forward of the incisors?

*Dr. Smith.*—My observation is, Mr. President, that at that time, when the sixth-year molars are well in place and established,—that is, when they have been there for six or seven years and are firmly embedded in the jaw,—that I question whether you could obtain any great movement posteriorly of those teeth. The tendency to move is anteriorly. We often see that later in life, when a child, who in the teens presented a perfect æsthetic line, will show a few years later the lower central incisors and lower lateral incisors overlapping. Of course, this is due in a measure to the erupting of the lower wisdom-teeth, and yet in many instances where the twelfth-year molar or the wisdom-tooth is extracted you still have that overlapping. The case which you cite and the advice given by Dr. Davis may have been largely influenced by circumstances; but where the object sought is to prevent this lateral impingement, I

should prefer to take out the second bicuspid if the other teeth were good. We are forced sometimes, especially in infirmary work, to do things which may not be in accord with our own wishes.

*Dr. Cooke.*—Is the essayist of the opinion that the decay between the bicuspid and the molar is due simply to food which is lodged there, or is that decay increased by pressure,—by the force that is exerted during the process of mastication? Is that a condition which of itself will produce more decay?

*Dr. Smith.*—I think that it has an influence; how much I do not know. The main point is to have these teeth drop back as far as possible, so that we can have them self-cleansing, permitting the free working of the saliva and fluids about the teeth. With such a condition, of course, the secretions and fluids are not held there. That is the main object in extracting. How much this real power of pressure increases the progress of decay in places which are already favorable to its advancement I am not able to say, but the closer the teeth are together the more difficult it is to get anything which is lodged between the teeth removed, and, therefore, decay must increase in the same ratio.

*Dr. Briggs.*—I think that what the essayist has said is in accord with my opinion of the subject, and I can only endorse his remarks. I was first brought up in the school, or at least under a preceptor who was very skilful in the use of the forceps and took out teeth very liberally. Later on, I came under the influence of too much conservatism; everything was saved, and it took me some time to emancipate myself from that into what I think now is a happy medium, where I do take out teeth for the sake of the other teeth in the mouth. I am sometimes confronted with a greater problem, perhaps, than any which has been presented here, in that the question comes of taking out better teeth than the essayist has shown. In some of the cases that he has shown the teeth have been so bad that it was not a difficult task to settle the question, but there are times when one takes out very good teeth in order to bring the whole mouth into a better hygienic condition. I think that there is sometimes a necessity for a word of caution and advice to practitioners who have started out with the idea of saving all the teeth, to prevent them from going too far in that direction. Only last week I had an example of this in a case that was sent to me from another practitioner, where the upper wisdom-teeth were in very bad condition. They had no opponents, no usefulness in the mouth, and yet they had been kept along and treated with soft-fillings. They were out of the reach of the brush and were not cleanly,



and as a consequence the whole mouth was affected by them; and it seems to me in such cases very foolish to insist on trying to keep such teeth in the mouth. The last case of this nature that I had was very interesting, in that the patient had some trouble from facial paralysis,—evidently some irritation which may have passed away and left the parts benumbed; or the teeth may have been blameless, but I found the chamber in the third molar on that side after extraction entirely filled with pulp-stone, which may have been the cause of the irritation. That tooth had been kept for years, keeping the whole mouth in an unkempt condition and serving no usefulness whatever.

As I say, however, when you have a case from childhood and have watched the progress of the permanent teeth, the sixth-year molars do not get in a very bad condition, and I find it more expedient in such cases, and it is my custom, to take out the bicusps. My own experience and clinical observations have led me to feel that, other things being equal, the sixth-year molar is the better tooth to keep, because if you carry a sixth-year molar up to the age of twenty, you can generally carry it on, under favorable conditions, during life; in other words, it is apt to improve. Bicusps, however, seem to begin at about twenty to deteriorate rapidly, and you are apt to get rapid decay or splitting; so I try as far as possible to make it appear that it is a bicuspid which should come out instead of a molar.

HENRY L. UPHAM, D.M.D.,  
*Editor Harvard Odontological Society.*

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## SOCIETY OF ALUMNI, UNIVERSITY OF PENNSYLVANIA.

THE Fourteenth Annual Meeting of the Society of the Alumni, Department of Dentistry, University of Pennsylvania, took place at the Colonnade Hotel, Philadelphia, the afternoon of June 6, 1894, Dr. Solomon Freeman, of New York, presiding. Members were present from New York, New Jersey, Delaware, Massachusetts, and Connecticut, as well as from the interior of this State. These, with the members residing in the city, numbered thirty-five.

Dr. Edw. H. Allen, of Freeport, Ill., presented a paper, which was read by Dr. McFadden, of this city, entitled "To what Extent should a Dentist be Conservative." Dr. A. H. Porter, of German-

town, gave a *résumé* of a lengthy paper on "The Physiology of Hypnotism," which will be published in the *INTERNATIONAL DENTAL JOURNAL* and *Alumni Annual*, the official organ of the Society.

The officers elected for the ensuing year are W. L. Winner, D.D.S., Philadelphia, President; F. A. Peeso, D.D.S., W. E. Christensen, D.D.S., and A. H. Porter, D.D.S., Vice-Presidents; J. Edw. Dunwoody, Philadelphia, Recording Secretary and Treasurer; George C. Küsel, M.D., D.D.S., Corresponding Secretary; H. B. McFadden, D.D.S., and George T. Cornelius, D.D.S., members of Executive Committee.

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### CONNECTICUT STATE DENTAL ASSOCIATION.

THE Thirtieth Annual Meeting of the Connecticut State Dental Association was held at Hartford, May 15 and 16. The following gentlemen were elected officers: Dr. Chas. P. Graham, of Middletown, President; Dr. Clinton W. Strang, of Bridgeport, Vice-President; Dr. George L. Parmele, of Hartford, Secretary; Dr. Daniel A. Jones, of New Haven, Treasurer.

*Executive Committee.*—Charles McManus, E. C. Barker and W. H. Rider.

Mr. Charles T. Wells, son of Horace Wells, the discoverer of anæsthesia, was unanimously elected an honorary member. The following gentlemen, having been in practice in the State over fifty years, were elected active members for life: Dr. S. J. Tuller, J. A. Pelton, and Geo. H. Waters.

Papers were read by several of the members and by Dr. Thomas C. Stellwagen, of Philadelphia, Dr. C. E. Francis, of New York, and Dr. Marfield, of Holyoke.

The Association publishes monthly a bulletin for distribution among the members.

The following resolution was introduced by Dr. Jas. McManus:

*Resolved*, That the members of the Connecticut State Dental Association, in commemorating the semi-centennial of the discovery of anæsthesia, feel it a duty to briefly restate and publish a few facts, so that the present and future generations may know the truth regarding it. In the ages past many men may have given one or more drugs with the hope of giving freedom from pain during surgical operations, but the fact is indisputable that Dr. Horace Wells, of Hartford, Connecticut, was the first man to deliberately take by inhalation an anæsthetic, and to persistently after proclaim to the world that a surgical

operation had been performed on him without pain, while under the influence of nitrous oxide gas (an anæsthetic), December 11, 1844.

We would not detract from, but willingly give all due credit to, the men who have since that memorable day introduced other more powerful and dangerous anæsthetics, and which for a time were so successfully forced upon the public, by the recommendations of the medical fraternity, that the safer anæsthetic discovered by the dentist, owing to his early death, was nearly stamped out, and humanity for many years was deprived of its use and its blessings, until it was again taken up by Connecticut dentists, and its value as a safe anæsthetic proved daily since 1868 in thousands of operations.

The physicians and surgeons of the city of Hartford united in a testimonial, declaring their belief in the justice of the claims of Dr. Wells, in 1845-46.

The General Assembly of Connecticut, in 1847, passed resolutions in favor of Dr. Wells, the discoverer of anæsthesia, and declared that he was entitled to the favorable consideration of his fellow-citizens, and to the high credit of a public benefactor.

The Court of Common Council of the city of Hartford passed resolutions to the same effect.

In France, the medical society in Paris, January, 1848, voted: "To Dr. Horace Wells, of Hartford, Connecticut, is due all the honor of having first discovered anæsthesia."

The State of Connecticut and the city of Hartford, with the added contributions from citizens of this and other States, have had placed on Bushnell Park, in Hartford, a portrait statue in bronze of Dr. Horace Wells; and the past year the Board of Dental Commissioners have had stamped on their certificates of registration and license a seal, on which is a medallion head of Dr. Wells, to remind all dentists in this state of the honor due to his memory.

The public should not be allowed to forget that the simple, honest, Christian desire of this dentist was to give his discovery to all to be "free as the air we breathe," and his course in regard to it stands out grandly when compared with the extortionate plans laid by all other vendors of secret anæsthetics, for the use of which they demand of suffering humanity an unjust tribute.

Drs. Geo. L. Parmele, Jas. McManus and Civilion Fones have been appointed a committee to arrange for the semi-centennial celebration. It is proposed to have a banquet, and to place a memorial tablet to mark the spot where the first operation under an anæsthetic was performed.

GEORGE L. PARMELE, D.M.D.,  
*Secretary.*

## Editorial.

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### PRINCIPLE IN PRACTICE.

It is sometimes difficult to carry ethical laws into the professional daily work, and in some of the important relations of the business and political world it seems wholly neglected. The somewhat trite expression that "business is business," meaning thereby that the altruistic idea is always to be subordinated to the selfish advancement of the individual, has, it is feared, become the motive force of large combinations of men to the destruction of the moral law supposed to be necessary for the government of the individual.

The effort has always been, in professions, to eliminate this idea and give a higher tone to the relations between the lawyer and his client, the divine and his congregation, the doctor and his patient. The honorarium of the physician is time-honored, and while it has practically no existence in this country it is still an active force in the Old World, and in some nationalities to send a bill for services rendered is regarded as wholly unprofessional.

While the activities of the world have made inroads in these usages, and modified the ethical code to bring it more in harmony with business ideas, the impress of a higher moral law for the government of professional men still remains to modify the selfish side of human ambition and human greed.

While it is true none of the callings named will work without remuneration, they each, in their special way, labor without a hope of reward to an extent that the outside world knows nothing of, nor, it may be presumed, would it appreciate it. The sentiment of helpfulness to your neighbor will never die out while professions live, however much individuals belonging to them may endeavor to turn the current of thought in other directions.

We are not so much concerned in this article with what may or can be done to help suffering humanity without hope of reward, as we are with the ethical upbuilding of the profession in which we find ourselves workers.

Dentistry began as a trade and the instincts of trade have closely adhered to it, and in the evolution towards a profession it has been found difficult, if not impossible, to remove this taint and bring it more into line with the professional spirit. That much has been

gained must be acknowledged, but that more is needed must be apparent to every active observer.

The higher development can only come through a more elevated standard of education, both primary and professional, but much may be done to hasten a better conception by personal influence, one upon the other.

One of the most encouraging evidences of a change for the better is manifest in the higher tone of dental journals. Formerly, indeed less than a decade, the conductors of these periodicals were satisfied not to lead but to follow, and this course, unfortunately, led most of them into a lower standard than the profession then occupied. This may be accounted for upon the fact that dental journalism had its origin in trade and was not able to rise above its source. That the publishers of these periodicals have seen the necessity for a change of tactics, and have permitted a large margin of liberty to their editors, is a happy omen of a better state of things, but even here much remains to be desired. The character of some of these is by no means up to the standard of dignity always to be maintained in professional work, whether in the office or at the desk.

It is trite to say, but nevertheless true, that professions are made up of individual elements, and in proportion as these become purified will the entire body advance towards perfection. That we have reached this desirable stage in our progress cannot be said with truth. There is still a tendency to accomplish ends by means not altogether creditable and oftentimes injurious.

Perhaps this is more noticeable in the effort of the few to appropriate the work of others without giving due credit or no credit at all. This tendency to plagiarize was alluded to in a former article, and need only be mentioned here as one of the evils of serious magnitude infesting professional work.

The one great obstacle to progress is the want of moral fibre to withstand the temptations constantly presented in practice. These come in various forms,—the wrong done to patients by not doing the best possible for them; the shameful neglect so often witnessed in performing the daily operations; the lack of that necessary care in sterilization, and indifference to the possibility of spreading disease through uncleanness; the effort to perform unnecessary and expensive operations for the purpose of personal credit, and, above all, in the use of medicaments, compositions of which the operator is ignorant.

This latter offence has become so serious that a determined stand

is necessary, or the dental profession will become a by-word and reproach.

The word "obtundent" has become offensive in the ears of those anxious for better things. Empirical preparations are to-day endangering the health and even the lives of dental patients, but more than this, they are sapping the moral vitality of the profession.

The time has come for a decided position on this question by all the organizations of the world, as the evil is not confined to any one country. The lack of moral strength is to be pitied that leads a dentist to use these unknown compounds, under the weak plea "that my neighbor uses them and, if I am to live, I must."

That ignorance lies at the foundation of this practice must be apparent, ignorance of the possibly dangerous results when injected hypodermically, and ignorance of the pathological laws governing sensibility in tooth-structures.

We have not the space to enter into this branch of the subject, and must be content with asserting, somewhat dogmatically, that the entire obtunding of sensation means a loss of tone and possible destruction of the conductors of sensation. Illustrations of this may be found in the devitalization of pulps, and in necrosis from hypodermic injections.

The moral degradation of the professional spirit is the more serious evil. There is but one course to pursue in this, as well as other matters of an ethical character, and that is, to walk closely to the path which leads to the best interest of those with whom we have to deal, and in thus doing we will be able to keep in the road that leads directly to the higher moral law enunciated nineteen hundred years ago.

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## Obituary.

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DR. J. W. RHONE.

THE subject of this sketch was born in Potter Township, Centre County, Pa., on January 20, 1833. He was sent to Pennsylvania College, Gettysburg, Pa., to complete his education, but was recalled upon the death of his father. He then, in connection with his mother, managed the ancestral farm. In 1859 he married Miss Caroline E. Keller, and engaged in mercantile business, but, finding

that this occupation was neither congenial nor profitable to him, he returned for a time to his former occupation, that of a farmer. Owing to an injury, he was physically unable to endure hard labor of this character, and in the fall of 1862 he began the study of dentistry with John Wingate, D.D.S., at Bellefonte, Pa. He prosecuted his studies under his preceptor until the fall of 1863, when he entered the Pennsylvania Dental College, Philadelphia, but, owing to the necessity for active employment existing in his case, he did not graduate with his class (1865), but in 1864 began the practice of dentistry at Boalsburg, Pa. In 1874 he removed to Bellefonte, Pa., and here almost immediately his thorough knowledge of his profession and his careful and conscientious work found recognition.

In February, 1891, by a fall on an icy pavement, his right hip was broken, and he was never again able to walk without crutches; but, with characteristic determination and fortitude, he resumed operative work and continued to perform it to the day of his death. He was the father of two children,—Miss C. Ellen Rhone and Dr. Charles E. Rhone, of Bellefonte, Pa., who graduated in dentistry at the University of Pennsylvania in 1889.

Dr. Rhone in his chosen profession was thorough and progressive. He endeavored to keep abreast with the times, and, indeed, kept in advance of many of his professional brethren who had had greater advantages than he. He was respected and beloved by the entire community in which he lived his blameless life, and was the embodiment of the quiet, earnest, Christian gentleman.

He died suddenly on May 15, 1894, of organic disease of the heart, leaving a widow and the two children above named to mourn his loss.

B. F. K.

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## Domestic Correspondence.

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### REPLY TO EDITORIAL IN THE "DENTAL COSMOS."

TO THE EDITOR:

SIR,—There appears in the April issue of the *Dental Cosmos* a most excellent editorial under the caption "Dental Scientific Work," and it may seem strange that any one could find reasonable ground for passing adverse criticism upon it, or for questioning the sin-

cerity of the thoughts to which the editor has so ably given expression.

It is probably true that the great majority of dental practitioners have neither the time, the means, nor the inclination to engage in original research or study which would add one iota to the common fund of knowledge in any single department of our calling, and that such work is, as the editorial admits, confined to a small proportion of workers who, imbued with the love of finding out the truth for the truth's sake, are ever working, each along different lines and by different methods, to find out some new thing which can be given to the whole profession for the benefit of mankind.

Work of this character, when entered upon in the proper spirit, is, unquestionably, "a labor of love which brings its full compensation in the results achieved," and rarely, if ever, involves any self-sacrifice; but I doubt very much if there was ever a man in our ranks who began faithfully and conscientiously the work of scientific investigation with no baser purpose in mind than to give the results of such investigations freely and cheerfully to his brother practitioners who did not meet with abundant opposition of some kind, or who failed to have the satisfaction, sooner or later, of knowing that such work had proved to be of help to others, or the means of encouraging them to still greater achievements along a similar line of work.

And yet it is strange, but nevertheless true, that there are journals, or rather, shall I say, a *single* journal, claiming upon its title-page to be "devoted to the interests of the profession," whose columns it is given out to be interpreted, editorially, are always open for the publication of papers reporting the results of original work, and yet declining at times to publish such papers when offered.

"Only comparatively rarely," does the editorial article assert, "are reports or statements made which are founded upon original research or experiment, or even upon accurately-observed individual phenomena." If it is true, as the editor assures us in the following lines, "that it is only such matter that can possess any scientific importance or lasting value," he does not make it quite clear just *why* "it must be evident that we are wasting time and energy in giving it attention."

If we are to credit the accuracy and sincerity of the first part of this statement, with whom lies the fault if such reports, when sent to the journals, are not given the widest possible publicity?



Again, if it is true, as the editorial goes on to say,—and I have no reason to dispute the assertion,—“that to properly observe and interpret selected phenomena is the initial step in scientific investigation, and the ability to correctly reason and generalize upon the results so obtained is what constitutes the scientific method of thought,” it certainly cannot be out of place for me to say here that it is upon that very line that I have been conducting my own investigations during the last three or four years in the department of therapeutics, for the reason that this department offers to me at least a fascinating and increasingly interesting field of work, and one in whatever success I may have achieved has proved in its practical and clinical application especially gratifying in its results.

It is known to many that my work in this direction has been conducted always with the one single purpose of adhering strictly to the homœopathic law of similars as laid down by Samuel Hahnemann, and for the purpose of encouraging others *never* to accept the results of my work upon my own *ipse dixit*, but rather to first prove all things for themselves and hold fast only to that which is good.

It was this spirit which prompted me to prepare a paper entitled “The Philosophy of the Homœopathic Law of Cure, and the Advantage to the Dentist of a Correct Understanding of its Application,” read before the Massachusetts Dental Society at its twenty-seventh annual meeting, and afterwards to submit it to the *Dental Cosmos*, that it might be “published broadcast for the benefit of my colleagues,” but which, for some reason best known to the publishers, was returned to me with a letter stating that it was “not considered available for the purposes of that journal,” whatever that phrase may mean. The paper was subsequently published in the November, 1892, issue of the *INTERNATIONAL DENTAL JOURNAL*.

It cannot be denied that the editorial is a timely one, and has the proper ring to it; and it most assuredly *ought* to inspire the young, the active, and the brainy men in our ranks to cultivate the spirit and love for scientific study, not alone for their own benefit, but for the good of the entire profession; but it seems to me a pertinent thing for some one to request of the *Dental Cosmos* an open definition of the phrase in its application to the acceptance or the rejection of papers that modestly claim to be scientific. It would furnish at least a common ground of understanding between editors and dentists as to what really constitutes dental scientific work, and what course must be pursued with the *Dental Cosmos*

from now on, before the results of such investigations can be published in the broadcast manner so ably advocated by its universally esteemed and respected editor.

It was Lord Bacon who once said, "I hold every man to be a debtor to his profession: from the which, as men do seek to receive honor and profit, so should they by way of amends endeavor to be a help and ornament thereto."

Aside from the fact that there is nothing in the editorial which at first sight would call forth anything but words of the highest praise and commendation for the sentiments expressed, there is, nevertheless, under the circumstances to which I have referred, a vein of grim humor running through it which only goes to prove the fact, or point the moral, if one there be, that there are journals and journals,—some that are unquestionably devoted to the interests of the *whole* profession, others that are only apparently so.

Yours truly,

CHAS. N. TAFT.

CHICAGO, ILL., May 5, 1894.

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## Notes and Comments.<sup>1</sup>

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**PATHOLOGY OF THE ALVEOLAR DENTAL MEMBRANE.**—Mr. E. Lloyd Williams read a paper on this subject at a recent meeting of the British Dental Association, which is reported in the *Lancet*. He objects to the term "abscess sac," so often applied to an enlarged and inflamed alveolar dental membrane, as being both misleading and unscientific. In the first place, he says, it is not a sac at all, but a solid mass; and, secondly, in the great majority of cases there is no definite abscess to be found. With regard to the cause of inflammation of the root membrane, septic infection is by far the most common, as in nearly all cases it occurs where the pulp is dead and decomposed. According to Mr. Williams, no such thing can take place as a localized periostitis, the whole membrane being invariably affected, though the severity of the attacks may vary in

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<sup>1</sup> The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 212 South Fifteenth Street, Philadelphia.

different parts. In the earliest stage of alveolar dental periostitis there is an infiltration of cells into the tissues; later a very loose arrangement of tissue of an adenoid character is seen; and, finally, a large number of areas of inflammation are apparent where the leucocytes have collected and are in sufficient quantity to justify the statement that pus is present; but these foci may so coalesce as to form one large suppurating cavity. Beyond these foci of inflammation a varying thickness of fibrous tissue is found. Micro-organisms, chiefly cocci and rod-shaped bacilli, are found in abundance, more especially in the neighborhood of the blood-vessels, but the essayist failed to discover any in the fibrous tissue or "limiting membrane," as it might be called. With regard to the changes in the contiguous structures, the surface of the bone next the fibrous tissue is, as might be expected, covered with a layer of giant cells, and the cementum, together with the dentine, shows signs of absorption with redistribution, in a great many cases going on synchronously.

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**PLASTER OF PARIS.**—The following methods of testing the quality of plaster of Paris are given in the *Charlotte Medical Journal*: First take a small pinch of the powder between the thumb and finger, and gently rub it; if small particles of grit are felt, it indicates that parts of the plaster have already absorbed water, and it is, therefore, unfit for use. The same test may be observed by taking a pinch of the powder again and, placing the fingers under water, rubbing in the same way as before. If, however, in both of these tests no grit is felt, and under water a thin, creamy substance is formed, which is easily rubbed off the fingers, the plaster is in a proper condition for use. Where the plaster has been kept for a long time, or where it is gritty, its condition can be greatly improved. It may be redried by putting it in a metal dish, such as a pie-plate or iron pot, and placing it in an oven of a hot stove or over a gas-jet. As soon as it becomes heated it will be observed that a process identical with boiling water is taking place. When this ebullition has entirely ceased, the powder is freshly kiln-dried. If the method of testing is again resorted to, it will be found that the gritty appearance and feeling will have disappeared in a very large measure, leaving only the fine dry powder ready for use. If there are any lumps remaining, they may be removed by the use of a sieve. From what has been already said, it will need be but a reminder that the plaster of Paris must always be kept in an hermetically sealed jar or in a very dry place.

**ASEPSIS AND ANTISEPSIS.**—Henry R. Wharton, M.D., contributes to the *Pacific Dental Journal* an exhaustive paper upon the "Theory of Asepsis and Antisepsis in Wound Treatment."

In the introductory of this article, the doctor says the term "asepsis," applied to wounds, implies that the wound is free from those vegetable parasites or micro-organisms whose presence sets up fermentative changes, accompanied by suppuration and constitutional disturbances.

"Antisepsis," on the other hand, has reference to the means employed to bring about the destruction of the micro-organisms which may be present in the wound or upon the instruments, dressings, or hands of the surgeon, and which, if not destroyed or rendered inert, will set up fermentative changes in the wound.

It has long been a well-recognized fact that albuminoid substances, such as dead animal tissue, blood, or blood-serum, will, when exposed to moisture, warmth, and the presence of certain living organisms or fungi, bacteria, and micrococci, develop putrefactive changes; and if these changes take place in the living body, there result certain constitutional disturbances, known as symptomatic, inflammatory, or septic fever.

It was also recognized that these putrefactive changes in albuminoid substances could be avoided by their exposure to heat or cold, or by drying, any of these conditions being sufficient to destroy or arrest the development of the micrococci. The micro-organisms which set up fermentative and putrefactive changes in animal tissue exist in great variety, but those which are of most interest to the surgeon or dentist belong to the "cocci" and "bacilli."

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**SEPTIC INFECTION FROM A BUR.**—The following note is made from an article by Dr. W. G. Beers, in the *Dominion Dental Journal*, illustrating the danger of careless or dirty dentistry: A young lady in perfect physical health, and whose mouth was as fresh and sweet as a rose in June, was having a lower molar cervical cavity prepared by a dentist, who only used a rickety old engine, but whose burs were so blunt that he had to put on extra pressure to make them cut.

Twice one of the largest burs slipped out of the cavity, tore the gums, and plunged into the mucous folds lying between the tooth and the cheek, revolving there several times before it could be withdrawn. The patient was dismissed after the cavity was filled, with-

out the least attention being paid by the operator to the wound he had inflicted.

About twenty-four hours after the accident the gum in the vicinity became tender and turgid. The face was swollen, the inflammation extending along the inferior maxillary, involving the depressor anguli oris, etc.

The inflammation facilitated the ingress of pathogenic bacteria, which are frequently, if not always, present in the mouth, on the *qui vive* for abrasions and wounds, and the consequences followed. To be brief, I made deep incisions directly into and across the place where the bur had entered with a fine lancet, then syringed fully and freely a four-per-cent. solution of carbolic acid, as hot as the patient could bear it, and packed the wound with absorbent gauze soaked in the solution. The following day I syringed thoroughly with hydrogen peroxide, which was followed by abundant effervescence. The gauze had kept the wound well opened, and the syringing with the peroxide did not, as it might if the orifice were small, distend the tissues and partially close the opening. To accomplish this, the lancing was thoroughly done. The next day I treated the case with pure oil of cinnamon on strips of gauze, followed by hot-water injections. On the eighth day the normal signs returned; the patient in the mean time had syringed every day with a mild antiseptic wash. What at first appearance seemed to prognosticate a dangerous case of septicæmia disappeared under the treatment. The constitutional disturbances were so great that the patient lost eleven pounds in weight, and, though convalescent, is still under the care of the family physician.

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## Current News.

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### WOMAN'S DENTAL ASSOCIATION OF THE UNITED STATES.

A REGULAR monthly meeting was held May 5, 1894, at 1602 Arch Street, Philadelphia, Dr. Anna T. Focht, President, in the chair.

Dr. James Truman gave an interesting and instructive talk on Dental Pathology.

A regular monthly meeting was held June 2, 1894, at 1300 Arch Street, Philadelphia, the President, Dr. Anna T. Focht, in the chair.

Dr. Bertha Jarrett read a paper on "Local Anæsthesia." The discussions brought out especial denouncements of the "Local Anæsthetic Man" who is working such havoc.

The next meeting will be held September 1, 1894, at Dr. Focht's office, Broad and Columbia Avenue.

EMILY W. WYETH,  
*Recording Secretary.*

8920 FAIRMOUNT AVENUE.

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### RECENT PATENTS.

A LIST of recent patents reported specially for the **INTERNATIONAL DENTAL JOURNAL** :

514,073.—Angle Attachment for Dental Handpieces. Frank K. Hesse, Boston, Mass., assignor to Codman & Shurtleff, same place. Filed November 2, 1892.

514,074.—Angle Attachment for Dental Handpieces. Frank K. Hesse, Boston, Mass., assignor to Codman & Shurtleff, same place. Filed March 11, 1893.

514,201.—Mechanical Dentistry. Lucius Robertson, Cincinnati, Ohio. Filed March 3, 1893.

514,289.—Dental Clamp. Joseph M. Strout, Portland, Me. Filed April 8, 1893.

514,882.—Dental Mandrel. Walter S. Elliott, Sag Harbor, N. Y., assignor of one-half to James W. Ivory, Philadelphia, Pa. Filed April 24, 1893.

514,941.—Dental Tool. Frederick A. Kotts, Manchester, Mich. Filed July 15, 1893.

515,126.—Dental-Engine Mallet. Frank M. McCarty, Shelbyville, Ind. Filed April 1, 1893.

515,400.—Artificial Tooth. Hardy B. Harrell, Gainesville, Tex. Filed December 29, 1892.

516,310.—Dental Impression-Cup. Henry L. Knight, Le Roy, Minn., and Hobert E. Duncan, West Superior, Wis. Filed June 15, 1893.

516,465.—Dental Engine. Frederick H. Berry, Milwaukee, Wis. Filed June 21, 1893.

516,529.—Dental Articulator. Florian E. Hansen, Minneapolis, Minn. Filed December 2, 1893.

516,700.—Dental Vulcanizer. Charles A. Davis, Pasadena, Cal. Filed December 13, 1893.

517,151.—Process of Manufacturing Dental Plates. George A. Tompkins, Cortland, N. Y. Filed February 23, 1892.

517,218.—Dental Engine-Head. Andrew J. Harris, Chicago, Ill. Filed October 22, 1892.

517,248.—Angle Attachment for Dental Handpieces. Rufus G. Stanbrough, New York, N. Y. Filed December 2, 1892.

517,249.—Angle attachment for Dental Handpieces. Rufus G. Stansbrough, New York, N. Y. Filed February 20, 1893.

518,175.—Dental Handpiece. Stephen H. Brooks, New York, N. Y., assignor to Edward A. Peirce, same place, and J. Otis Cox, Brooklyn, N. Y. Filed October 31, 1893.

518,701.—Dental Disk-Carrier. George B. Richmond, Lansing, Mich. Filed September 15, 1893.

518,877.—Dental Chair. John Hood and Stephen H. Reynolds, Boston, Mass. Filed January 27, 1893.

519,109.—Dental Chair. Thomas H. Gardner and Edward Gardner, Manchester, England. Filed December 6, 1892. Patented in England.

519,110.—Retaining or Lowering Apparatus. Thomas H. Gardner and Edward Gardner, Manchester, England. Filed November 20, 1893. Patented in England and France.

519,756.—Dental Chair. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed February 5, 1894.

519,757.—Dental Chair. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed February 6, 1894.

519,758.—Dental Chair. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed February 6, 1894.

519,799.—Light-Concentrator for Dentists, Surgeons, or others. William H. Thrift, Dubuque, Iowa. Filed September 5, 1893.

519,845.—Gas-Regulator. Theodore G. Lewis, Buffalo, N. Y., assignor to the Buffalo Dental Manufacturing Company, same place. Filed February 15, 1894.

519,883.—Dental Chair. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed February 5, 1894.

519,884.—Dental Chair. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed February 5, 1894.

520,593.—Tooth-Brush. Otto F. Hager, Buffalo, N. Y. Filed February 10, 1894.

520,867.—Dental Engine. Rufus G. Stanbrough, New York, N. Y. Filed December 2, 1892.

520,947.—Dental Chair. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed December 27, 1893.

520,948.—Dental Chair. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed February 5, 1894.

521,138.—Electric Motor for Dental Engines. Walter A. Crow-dus, Chicago, Ill., assignor to the Turney Electric Manufacturing Company, same place. Filed October 22, 1892.

Trade-Marks.—24,640.—Dentifrice. Luis J. de Carballo, New York, N. Y. Filed April 2, 1894. Essential feature the word "Eulalia."

24,846.—Dental Preparations. Joaquin A. Bermudez, New Orleans, La. Filed May 14, 1894. Essential feature, the word "Cameo."

Design.—23,189.—Dental Cabinet. William G. Hullhorst, Toledo, Ohio, assignor to the Ransom & Randolph Company, same place. Filed March 10, 1894. Term of patent, seven years.

#### LIST OF EXPIRED PATENTS.

187,573.—Dental Chairs. S. S. White, Philadelphia, Pa. Filed January 16, 1877.

188,329.—Dental and Barbers' Chairs. George W. Archer, Rochester, N. Y. Filed October 17, 1876.

189,249.—Dental Pluggers. K. L. Mills, Kansas City, Mo. Filed February 22, 1877.

189,409.—Dental Engines. B. M. Wilkerson, Baltimore, Md. Filed February 13, 1875.

189,526.—Dental Engines. G. W. Tripp, Auburn, N. Y., assignor to S. S. White, Philadelphia, Pa.

189,735.—Dental-Foil Condensers. John Hood and S. H. Reynolds, Boston, Mass. Filed October 25, 1876.

190,115.—Dental Tools. S. Babcock and C. E. Mason, Springfield, Ill. Filed November 29, 1876.

Reissue.—7670.—Dental Engines. Charles M. Curtis, Philadelphia, Pa., assignor, by mesne assignments, to M. M. Johnston, New York City. Patent No. 138,318, dated April 29, 1873. Filed April 23, 1877.



## Selections.

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### NEED OF INDEPENDENT MEDICAL JOURNALS.

THERE are two fundamental curses under which the profession in America labors:

1. The lack of independent medical journals controlled and issued by medical men for medical purposes. At present almost every journal is owned by some publishing or manufacturing concern, which of course publishes it for purely commercial purposes. It is easy to see that in such cases the advertising pages seek to control the reading columns. If an editor shows independence, and refuses to permit the commercial debauchery of his columns, woe be to him!

2. Co-operating with—nay, bound up with—this first misfortune, is the second,—the lack of a national or unitary organization. It at present seems to be impossible to arouse in the professional mind the recognition of the need of professional unity. Without professional unity we cannot speak to the people, criticise abuses, or encourage faint and sporadic attempts at virtue. We have no singleness or strength of voice, journalistic or organic; and from the multiplicity of non-co-operating jealous societies, together with the multiplicity of trade-journals, our professional disorder of speech is either a sorry laryngismus paralyticus or a sorrier laryngismus stridulus, whilst the omnipresent quack and patent-medicine men and the “likes of them” crowd every farm with nasty advertisements and huge bulletin-boards, and bribe to silence or a worse subserviency every secular newspaper of the continent.—*Philadelphia Letter in British Medical Journal*.

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### IS LYSOL POISONOUS?

IN answer to the question, Is lysol poisonous? which has been raised in consequence of a death in Bremen from the misuse of the article, Dr. Richard Drews, the children's physician in Hamburg, negatives the suggestion most decisively by an interesting case of a boy, only four years old, drinking undiluted lysol. The child, it was ascertained, had drunk about twenty-five grammes of lysol, but

the nurse-girl in charge, out of fear, maintained silence in respect to it, until the child, which smelt strongly of the disinfectant, became after the mid-day meal suddenly very white, complained of pains in the head and limbs, and vomited violently. Up to that time he had continued to play as usual. When the doctor was called the child was slightly cyanotic, the pulse 56 and scarcely to be felt, whilst the respiration was superficial and sometimes in abeyance. The stomach was immediately washed out, removing a turbid, soapy liquid, smelling strongly of lysol, the odor of which still clung to breath and mouth after five washings.

After the stomach had been washed out the boy wanted something to drink, and was given milk, the pulse and respiration having meanwhile become normal and the cyanosis disappeared. The child also wanted to get out of bed, saying that it no longer had headache, but was kept in bed until the following morning with no other nourishment than milk. The next morning he exhibited not the slightest sign of indisposition, although the breath still smelt of lysol, the odor of which did not disappear until the third day. He said that the lysol had tasted nice, like beer. Evidently the twenty-five-gramme dose had only caused a slight temporary irritation of the nervous system. Dr. Drews is therefore of the opinion that one- to two-per-cent. lysol solutions can be employed in infantile practice without any fear of harm, and agrees with Dr. Landau, of Frankenburg, as to its freedom from poisonous qualities. . . .

In gynecology and midwifery Dr. Rossa, of the Graz clinic, also emphasizes the extremely slight toxicity of lysol as compared with its high disinfectant value. For personal and external disinfection he recommends a one-per-cent. solution, and a two-per-cent. solution for gynecological operations. The latter causes a violent burning of the mucous membranes, in one case local urticaria, and in another acute eczema. Compared with carbolic acid and corrosive sublimate in a number of births, lysol showed a larger percentage of feverless lyings-in, and a smaller number of cases with high fever. In the carbolic acid and corrosive sublimate period two fatal cases of puerperal sepsis occurred, in the lysol period none. Dr. Rossa also found lysol especially suitable in two-per-cent. solution for washing out the uterus in incipient endometritis puerperalis.—  
*Notes in New Remedies.*

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## Original Communications.<sup>1</sup>

### DUPLEX OBTURATOR.<sup>2</sup>

BY DR. J. W. RHONE, BELLEFONTE, PA.

To enter upon a discussion of the anatomical construction of the normal palate and its functions in comparison with the abnormal, more particularly that of a congenital cleft palate, involving the hard and soft tissues, would seem unnecessary, as all seekers for information on these points can find them in our standard textbooks, and can also compare the normal with the abnormal in the living.

Correcting all the evils of this malformation is more than should be expected, but the leading difficulties that can be remedied are defective articulation and enunciation, and the escape of solids and fluids through the nasal passages, and the difficulty of swallowing.

This brings us to the important point, How can these evils be best overcome?

Judging from the past history of the surgical side of this question, surgery has not proved a success in this line.

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<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

<sup>2</sup> Read before the Odontological Society of Pennsylvania by Dr. Rhone, and received from him but a few days before his death. It is probably the last contribution he made to the work of his profession.—ED.

It would then seem that mechanical appliances of some kind are the only means of relief at hand. But here we are again perplexed; the number and forms of these appliances are quite numerous, and all laying claim to something that seems new and novel. It, however, is not the purpose of this paper to attempt a discussion of the merits or demerits of any, excepting so far as may be necessary by way of comparison.

However, with comparatively limited experience in the construction and adaptation of appliances to be of benefit to patients of the class named, I would state that *they must be made in two parts* to bring about the best results and most comfort to the wearer.

The obturator in one piece *cannot be made* to compare in adaptation and comfort to the duplex. The reasons are plain; no part of the rigid (one piece) appliance can move without moving as a whole, which *will* produce irritation and discomfort at some points. With the duplex obturator, if properly constructed, this is avoided. The front half of the plate will be firm, while the posterior half, a hard rubber velum, attached to the plate by a hinge,<sup>1</sup> can move freely at any and every motion of the cleft uvula, and the wearer is enabled to talk or read aloud, and, not least, take food with comfort.

It might be in place here to state that about twenty-five years ago I made an obturator for a then young woman (who had a congenital cleft palate of both the hard and soft tissues) on the plan described by Dr. E. A. Bogue. The description is found in the *Dental Cosmos*, vol. ix. This obturator also consists of two parts, but the joint is rigid with a soft rubber uvula. This part (the soft rubber) doubtless was meant to be the important part of this appliance, but in my experience proved very objectionable on account of becoming very offensive in a short time. Later I substituted

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<sup>1</sup> To whom the credit of the connecting hinge in obturators with a hard rubber velum (or "chestnut," so called in the *American System of Dentistry*) belongs I have no means of knowing, but there is a description of a hinge and bulb given by George Parkinson, M.R.C.S., of West London Hospital. See *Dental Cosmos*, vol. viii., page 449.

The hollow rubber bulb (or velum) and spring, as described in the *American System of Dentistry*, by Dr. Baker, proved unsatisfactory in my hands; either with or without a spring. With the spring there was an unpleasant grating that annoyed the patient, and without the velum was too light. The hollow rubber bulb, on account of its lightness, might answer a good purpose for children when first wearing an obturator in place of the perishable and offensive soft rubber.

hard rubber, which proved more satisfactory than the soft, which practically made it a rigid appliance.

So far as I know, the obturator is still worn, but in point of comfort and use to the wearer it bears no comparison with the duplex connected with a hinge.

In making this instrument with a hinge I have tried to combine what seemed to me good common sense principles.

While a good cast of all the parts of the mouth with the hard and soft clefts is desirable, it is not essential, as it can only be used as a general outline, not as the means to gain the end.

My method to take an impression is first to take base plate gutta-percha and soften in hot water, and mould to suit the mouth; bend a fairly strong wire and attach to the tray for a handle. This done, fill the tray with softened beeswax and take an impression of all the parts as near as can be taken with this material. This secured, trim the wax wherever it rests against the soft parts, at the same time shaping it so that it will retain the plaster in carrying it to the parts in the mouth.

A few words about plaster and how to use it. The plaster should be about medium in its setting qualities. Fill a mixing-cup about two-thirds full of water, and add small quantities of plaster, adding and stirring until it is about the consistence of thin cream. Keep agitating until the plaster commences to thicken, which may take five or more minutes, if too much plaster has not been added. The least quantity that will do the work will be the most satisfactory. While this method will take more time, the plaster will not be so strong, and will fracture more easily, hurting the patient less.

Before your plaster is ready have the patient in the chair, and as soon as the plaster is in the tray draw the head back with the mouth well opened, put your filled tray in good position in the mouth, and then draw the patient's head forward so as to prevent strangulation, and press the tray with its contents to all the parts as quickly and as gently as you can.

When the plaster left in the mixing-cup will break with a clean fracture, it is an indication to remove the impression, which can only be done in parts, but can be accomplished easily if care has been taken in mixing the plaster and in shaping the wax impression. When all the pieces are removed and placed on the tray, there will still remain some carving in places, and additions to make in others.

To get a perfect impression of the soft parts in their various positions is impossible. Any one that has observed the motions of the cleft tissue knows that the parts are seldom at rest.

Now varnish the impression, oil slightly, invert, and embed the upper half in plaster. When set, trim, varnish, oil, and build up one side with plaster. When set, shape the edges, varnish, and build up the remaining half. After the plaster is well set, if the sections have been properly taken, there will be no trouble in separating them. This done, replace the section of the cast and put away for future reference.

The next important part is to make the front part of the obturator, to which whatever teeth that are needed must be added, and at least one tooth, preferably a molar, on either side of the mouth should be clasped with a good substantial gold clasp attached to the plate.

Before taking the impression for the plate it will be necessary to close the fissure beyond the hard palate with softened wax, so formed that it can be easily removed without injury to the walls of the cleft. The margins of the cleft must, however, be exposed enough to be well defined in the impression, which should be taken with plaster in the same manner as for any other set of teeth.

After a good cast has been secured, proceed as in any other case where a plate with a few teeth and clasps are needed.

The upper side of the plate must be adapted to the margins of the cleft, and also a place provided for the anterior end of the hinge, which may at the same time be attached to the plate. The plate must not extend beyond the hard palate.

But there still remains the most difficult as well as the most important part to do, that of making, attaching, and rightly adjusting the hard rubber to take the place of the lost soft palate.

Before reaching this point, a good, strong, gold hinge should be secured, made of eighteen-carat plate; one thirty-second of an inch thick would not be objectionable.

The width of the cleft must be the guide for the width of the hinge.

The anterior end of the hinge need not be over three-eighths to one-half of an inch in length, and set forward from five-eighths to seven-eighths of an inch from the rear margin of the plate, and should extend from three-eighths to one-half of an inch past the posterior margin of the same, on which to attach the hard rubber bulb. It is important that the joint of the hinge has lateral motion, so as to allow the hard rubber substitute to move from side to side. The object of having the joint of the hinge so far forward is to prevent the rubber bulb from raising at too much of an angle.

After the hinge is connected, form a wax bulb wide enough to

fill the space above the cleft, somewhat oblong, rounding edges nearly flat on the nasal side, with a widening and depression towards the posterior, so as to give the lower side a partial arch, rounding towards the sides to allow the cleft tissue to play underneath on either side. Place the plate and the bulb attached in the mouth. Mark the wax wherever you find unequal pressure. Remove the plate and bulb and carve the wax where marked. Again replace and follow these directions until the plate seems comfortable, being careful not to get the wax bulb too small. This done, disconnect the hinge and duplicate the wax bulb in hard rubber.

Polish the rubber, connect the appliance, and place in the mouth, let the patient wear it until points of uneven pressure will make the parts tender. Mark the bulb at the tender points, remove the case, and carve the rubber at the places marked, and again polish, replace, and continue this course until the obturator is comfortable. At no time allow the parts to become chafed.

A lady for whom I made an appliance about six years ago on the plan as here described is as comfortable as it is possible to be under like circumstances. She can enunciate and articulate distinctly with ease, either in conversation or reading aloud.

But for any person to promise, or to state, that a person under such conditions could be enabled by means of *any* appliance to speak or read without betraying the defect to an experienced ear, would simply be an *exaggeration* and a *deception*.

Notwithstanding, when such unfortunates can be helped so as to be comfortable and be enabled to converse with ease and comfort to themselves and pleasure to their friends, we can lay claims to advancement.

There is another matter of no less importance than that of speech in this connection, that is the ability to take food without the necessity of leaving the table to remove particles collecting above the appliance to prevent it (the food) from passing out through the nostrils, as was the case with an obturator formerly worn by my patient, made of one solid piece of hard rubber.

Another difficulty no less unpleasant has been overcome with the duplex obturator she is *now* wearing.

## THE ONE MATERIAL.

BY MAX GREENBAUM, D.D.S., PHILADELPHIA.

THE desire for an ideal filling-material is not new, as attempts towards such end have been made repeatedly. With each result the cry came forth afresh that at last the material was here with which all cavities should be filled, however disappointment followed. The work involved in these attempts is enormous, and it seems as though it should have been productive of a closer approach to the requirements. But mastery of difficulties may be impossible at times, and even though results point to disappointment, when we consider their relation to the whole requirements, still they may be very gratifying, and the mastery which seems impossible in its complete form is effected in part. This is the condition in dentistry, and an analysis of this condition is our concern.

Before complying with this, we must recognize the powerful relation it holds to the great dividing line among practitioners, both sides of which are held as being scientific. A consideration of this becomes necessary for the sake of completeness. Nor is this all. Not alone that our purpose here embraces a consideration of the different materials as they relate to an ideal conception, together with the great controversy involved in the different estimations in which they are held, but also the elimination of a grave error. If both sides of a question are advanced respectively as being scientific, there is an apparent contradiction. Both sides cannot be scientific, and, as the strongest safeguard a question can have is a claim to a scientific basis, the matter requires adjustment. Let us then borrow aid wherever we can, in order to advance the end.

The first effort is to ascertain what side of the controversy, as comprehended in the differences between the old and new school in dentistry, can be called scientific. But before we can do that, we must understand what is meant by the term science or scientific. By the term science we signify knowledge founded upon self-evident truths, or upon a basis that simulates so closely a self-evident truth that it stands as an accepted fact. Arithmetic is a system of classified knowledge founded upon evident truisms. Whatever the result may be from any of these truisms, it is accepted and admits of no deviation. That is science in its strictest sense. But we have a more liberal understanding of what the



term science expresses that yet fulfils its meaning, as may be instanced by chemistry. The chemist deals with matter, but matter is no self-evident truth. In fact its ultimate expression cannot be comprehended; still the chemist, through experimentation, or by employing knowledge established and verified by means of experimentation, brings out new facts which also are classified as being scientific. This is the more liberal acceptance of the term,—knowledge gained through experimentation. It transpires sometimes that a fact belonging to a certain category of knowledge becomes subservient to the establishment of a fact, or facts, grouped under another division. Let us keep that in mind. Understanding, then, the meaning of the terms science and scientific, already a second question presents itself,—Which side of the great controversy is truly scientific? As it stands, the work of Dr. Palmer arranges itself on one side, and "defective manipulation" on the other. Now, both cannot be right, and therefore should not remain. An impartial examination, with whatever aid we can bring to it, should eliminate one or the other, and as the final result free our profession from such defects as the controversy implies.

Since teeth have been filled with gold its skilful manipulation has been considered *the* great attainment. The object has been the perfect introduction of difficult fillings,—the more difficult and nearer perfect the higher the standing of the dentist. This served as a powerful stimulus to the employment of foil; but after awhile a great many fillings failed, and as each failure presented itself the conclusion was reached that defective manipulation alone was the cause. Now, what does this explanation contain that can enable us to say of it, it is scientific? Is there anything appertaining to it that is founded upon a self-evident truth, or upon experimentation? Nothing. It is a mere surmise. We have no proof that such filling was introduced in a faulty manner, and therefore no right to assume so, providing we wish to keep within scientific bounds. But wishing to arrive at the truth, we admit the possibility of the filling having been introduced in a faulty manner, and in order to ascertain whether such was the case, we adopt a method.

We select an easy cavity, fill it perfectly, as we can do with great care and ability, and after completion feel thoroughly satisfied as to its perfection. We make a note of it; after three, four, or five years, as the case may be, we examine this filling and find it is not, by far, as perfect as when it was first introduced; we cannot say here defective manipulation is the cause of the imper-

section. However, we do not feel satisfied with the result of one filling; we try several more, and, insisting upon the truth in the question, seek the co-operation of other practitioners. All conclude to introduce fillings, as well as can be done in easy places and with more than average skill, and observe the result. After several years, as the patients return, the first observation is confirmed,—the fillings return and they are not by far as well as when first introduced. To persist in the face of such evidence to explain these results by the cry of "defective manipulation" is absurd, to say the least. All this has been done, and still the "cry" persists. From beginning to end it is seen to be either an unfounded surmise, or else an answer framed in greatest error, both devoid of such procedures as are requisite to formulate a scientific explanation. Another argument may be adduced to strengthen the final one, why the cry of "defective manipulation" should be eradicated. It is historical that first answers usually prove erroneous. Were it not generally so accepted, numerous instances could be given how explanations in respect to gravest questions were compelled to adapt themselves to later discoveries, in some instances being entirely controverted. Here, too, then, there is a similarity that tends to relegate the cry of "defective manipulation" to an insufficient and erroneous state.

What merit does the second explanation contain? It is a result of investigations. Contrary to the first answer, which upon analysis was found to be mere guess work, or else an erroneous committal, the second is an impartial result of investigations directed to the purpose. However, it may be argued that even investigations, though scientific, if founded upon a false basis, produce false results, which is a fair criticism. What remains, then, is the demonstration that the basis is intact, which, together with scientific procedure, must bring about scientific results; and if scientific, they are correct, and in being correct supersede those that may antagonize their general or detailed expression. The best way to demonstrate a basis to be intact is to compare it with knowledge that stands accepted in the strictest sense of the word,—about which there is not the slightest antagonism,—or to apply it variously; and if this can be done consistently it certainly stands confirmed, and the least we can say is to pronounce it belonging to a very high order of knowledge, and one that is clothed in general verity. If it can be proved, then, that the basis contained in the second answer agrees with established knowledge, or can be applied variously with consistency, the least we can say of it is to pro-

nounce it a very high order of knowledge, which is by itself far in advance of what we can say of the cry of "defective manipulation."

It is current among those whose business it is to know of such things that all particles of matter possess molecular motion. As our knowledge concerning matter is simply an approximation, for in its ultimate form it is beyond our understanding, we dare not construe this to be a definite, visible motion. Again, when we consider the fact, as held, that "matter is but an expression of force, under certain conditions in relation to our intelligence" (Spenser), which is the broadest conception we can frame, or the Newtonian conception as consisting of centres of attractive and repulsive forces, which is not as broad, together with the doctrines that "force is the very ultimate conception intelligence can frame," and that "matter and motion are concrete correlations of it" (Spenser), the assumption of molecular motion is a veritable deduction. Furthermore, if we admit into the argument the truism that "every particle of matter is at every moment going either from a point of integration to one of disintegration, or conversely, concomitant with which, in the first place, there is gain of motion, and in the second place loss of motion" (Spenser), it furnishes additional data for the conception of molecular motion. These are truisms expressing that unification of scientific knowledge which is the highest testimony to their legitimate nature. But another statement of a law must be observed,—*particles on coming in contact with each other produce such redistributions, concomitant with which certain motion must take place, or a certain expenditure of force.* Now, this is the truth we are seeking, and with it the work of Dr. Palmer harmonizes. Having set forth in the beginning what constitutes a scientific procedure, the value contained therein, together with the fact that if a result be applied variously, and serves with consistency in all applications, it is the highest evidence for its acceptance, and, furthermore, that all positive affairs are governed by these conditions, thereby securing unity of knowledge and correct interpretations, what now remains is the observation that the deduction of Palmer's work expressed in incompatibility of filling-material with tooth structures coincides with the general truth found; then all points converge to that centre of harmony which expresses the strongest evidence of their verity.

The redistribution of matter and consequent expenditure of force upon particles coming in contact with each other is identical to the disintegration of tooth-structure around fillings and consequent evolution of a galvanic current.

It must be understood that the current or force attending redistribution does not disintegrate tooth-structure, but aids in forming an increased amount of acids through secondary decomposition, and the increased amount of acids expedites failure.

This, then, is the fundamental agreement expressing that harmony which is the strongest evidence of its verity. To controvert the statement that disintegration is the inevitable result when fillings are introduced into cavities is equal to the attempt to antagonize the truism of redistribution of matter, and to antagonize that is to gainsay the accepted doctrine among foremost scientists.

Upon slight notice the foregoing may appear irrelevant to the title subject; however, an attempt to define respectively the positions of filling-materials must embrace a consideration of tooth-saving ability, and as great difference exists in opinion upon this point it became needful to effect some adjustment. The foregoing establishes the truth in the question, which is that gold, although lauded at one time as the material with which all cavities should be filled, to-day occupies a much lower position. The truisms with which we set out express unification of the highest scientific knowledge; if, then, they do not support the above statement, the statement is not true. However, just how much everything is in accord, it is only necessary to point out that the malleting of foil, which is imperative for its proper introduction, results in greater redistribution than without it. Every blow is accompanied by molecular rearrangement, and with every molecular rearrangement there is a corresponding expenditure of force. This is the simple expression. But there must be a compound expression. The molecular arrangement of the gold itself must undergo change through the force employed in inserting it, aside from the rearrangement of the structure of the tooth. This acts upon itself and reacts upon tooth-structure, and conversely. It is evident, then, that gold produces great molecular rearrangement, and consequently great expenditure of force, and as this is analagous to the disintegration of tooth-structure and failure of fillings, and depends in degree upon the structure of the tooth, what we stated as being the truth in the question without confirmation becomes the truth with it.

We may now pass on to the subject proper. There are other considerations that negative gold from the ideal stand-point,—it is not easy to introduce into cavities. This presents a two-fold argument; with the necessary care and skill attending it comes a wear upon the organization of the operator which cannot exist

long without some break,—one of our ablest operators died at a comparatively early age from the excessive wear attending the use of gold. Then, too, the discomfort to which some patients are subjected are contrary considerations. Not infrequently complaints concerning the irritation upon application of the dam, or forceful separation of teeth, precludes work for the time being, or even a second attempt at the operation; especially is this so with highly nervous temperaments.

Conductivity and inability to be matched to the color of the tooth. Conductivity cannot be a quality of an ideal material. Such delicate sensibilities as displayed by the pulp render conductivity highly objectionable. Too many patients complain of the pain from thermal changes after the insertion of gold fillings, even though care may have been taken to employ pulp protectors, but where protection is rendered by substances that do not touch all parts of the cavity, the operator having deemed it expedient to apply the protection over the region of the pulp alone. Inability to be matched to the color of the tooth makes any material unideal. The ideal material must be one that can be finished with enamel lustre, and until a permanent preparation possess this quality, along with the others, we are unable to speak of an ideal material.

So far our considerations concerning gold have been of a negative nature. Let us see now what merit it has. Permanency under favorable conditions; this requires no extended comment; of all the attributes, permanency stands conspicuous. No matter in what respects a material is esteemed valuable, if it possess no permanency it stands, generally speaking, beneath those materials that have permanency; and gold under certain conditions is permanent. In hard-structured teeth, where the malleting of foil is not accompanied with such redistributions, and in consequence with no such expenditure of force as in soft-structured teeth, gold is a permanent filling. A good gold filling in such a tooth is certainly a permanent affair, lasting as long as the tooth remains in its socket. It is such teeth that have established the high position of gold as a filling-material. Non-shrinking and non-expanding are attributes of the ideal material and of gold. When we consider that much of the odium attached to amalgam arises from the crevicing due to its spheroiding tendency, although it can be remedied with the greatest ease, thereby securing a most valuable filling, we feel the importance of these attributes; and gold possesses them. By the foregoing considerations can be grouped resisting capability; the importance of that is self-evident; as so many cavities are situated in

places exposed to attrition, we must look upon ability to resist attrition as an essential requisite of a material; although marked by qualities that justify the high position gold occupies, still the material is far beneath the ideal one. Its relative position among other materials usually employed may be noted more fully as the other materials are compared with the ideal attributes.

By the side of gold may be grouped tin-foil; with the exception of tooth-saving attribute, which with tin-foil is far greater than gold, and resisting capability, which is far less, its other qualities are so alike to those of gold that no separate examination is necessary.

The permanency disclosed by gold fillings under favorable circumstances contrasts so decidedly with the temporary service fulfilled by cement fillings that it seems in place to consider the cements next. The only preparation used as a filling-material is the zinc phosphate, and this, too, has its favorable and unfavorable aspects. It is comparatively easy to mix, easy to introduce into the cavity, adhesive to cavity-walls, has sufficient plasticity for continued manipulation, hardens with sufficient rapidity after finishing, offers resistance to attrition, is non-shrinking and non-expanding, is compatible with tooth-structure, non-conducting, and can be matched to the color of the tooth. In all these respects zinc phosphate is the ideal material. Easy to mix and easy to introduce into a cavity are attributes which have been considered in connection with gold. There we found the contrary to obtain, with its detriments; here we have them as attributes, with their advantages; adhesive to cavity-walls. Very frequently hypersensitive places require attention that cannot be shaped to retain any filling; in such places zinc phosphate, through its adhesive qualities, can be used. Then again, when we consider the great care with which cavities must be prepared to properly retain other fillings, and even in spite of accurate preparations fillings work themselves loose, we may further appreciate the advantage in the ability of the filling-material to adhere to the walls of the cavity. The plasticity of zinc phosphate, together with the degree of rapidity in hardening, are qualities that redound to its advantage. Although zinc phosphate sets quickly, after a time we learn to manipulate it so handily that the filling is introduced, properly trimmed and smoothed, and then pronounced set; and there is no material which we can introduce into a similar cavity and call it finished in the same length of time. The degree with which it hardens is considerable, giving it good body to resist attrition.

Non-shrinking and non-expanding, as stated in connection with gold, become the more important when we observe the criticisms hurled upon amalgams because some of them shrink. The ideal material necessarily does not shrink nor expand, and zinc phosphate inasmuch has further claim to ideal distinction. Compatible with tooth-structure, this quality is the basis of all calculations. The conscientious exponent of the profession has for his motto tooth-salvation, and with no material can teeth be saved unless those are employed of which we can say, they are compatible with tooth-structure. The length at which we discussed the cause of failure in filling-operations may become now more obvious. It is the starting-point, and gives a material the valid claim to the distinction of being a filling-material while no other quality will do as much; non-conducting attribute and the ability to finish with enamel lustre are two stand-points from which zinc phosphate appears highly commendable. The irritation manifested through the conductivity of metal fillings at times results in serious complications, and occasionally necessitates the drilling out of recently introduced fillings and substitution of others with better pulp protectors; although zinc phosphate does not finish with enamel lustre, yet it can be matched to the shade of the tooth accurately; in fact, approaches the color of teeth better than any material in use with the exception of porcelain, and that we do not yet consider among our generally-employed materials for stopping teeth, so that we can say of zinc phosphate, it approaches the color of teeth better than any filling-material we employ. In all these respects zinc phosphate stands near to the ideal material. So many qualities appear in its favor, that from casual observation it may be wondered that there is any doubt as to its highest position among filling-materials, but we have to consider simply one deficiency, and it sinks to the lowest position, and that is its solubility in the fluids of the mouth; all the high respects in which zinc phosphate may be entertained are counter-balanced by its disintegration in the oral fluids, and ranks simply as a valuable adjunct. In spite of all that has been done to overcome this, practically very little has been accomplished. Zinc phosphate fillings dissolve in the oral fluids as much to-day as ever before. Should something be introduced to eliminate the deficiency to succumb to oral fluids, then indeed it will appear as though we had the ideal material. The disintegration of zinc phosphate fillings is not the only charge against them; there is another, although less important,—the liability to irritate the dental pulp. Many teeth have lost their vitality through the irritation of such fillings when

the pulp-tissue was not properly protected; but with proper care this can be overcome entirely. And next within these considerations comes gutta-percha. In contrast to the former material here we have a substance that under favorable circumstances cannot be surpassed in permanency. In places where no other material seems able to maintain the integrity of the tooth, gutta-percha can be depended upon; and, as this is our essential point, gutta-percha holds correspondingly a very essential place in our list of filling-materials. As we found gold unworthy of the precedence accorded it, because it cannot save those teeth that require saving most, so is there ground for holding gutta-percha in very high estimation. Upon inquiry we ascertained that gold fillings resulted in early failure, because of the greater redistribution consequent upon its apposition with tooth-structure. So here we find gutta-percha, in its introduction into cavities, free from the force employed in the insertion of gold, which is sufficient to account for lesser redistributions and greater ability to maintain the integrity of the dentinal tissue.

Of the other attributes belonging to the ideal material, gutta-percha can lay claim to some: softens readily under heat for proper introduction; can be easily introduced into cavities; is non-irritating to the pulp; is non-conducting; can be matched to the shade of the tooth; is nearly insoluble in the fluids of the mouth. Some of these qualities require no further recommendation. The easy introduction of gutta-percha may be remarked upon. This does not signify introduction as the procedure is generally understood, with temporary stopping. Many gutta-percha fillings are introduced by heating the material over the spirit lamp and then pushing it into the cavity, and the name of a filling is bestowed upon such operation. When we say gutta-percha can be introduced easily, it is from the comparative stand-point; although inserted piece by piece, yet there are no thoughts about perfect adaptation and perfect condensation. It appears strange when we observe how one material may lack in a certain attribute,—as zinc phosphate, for instance, lacks in its inability to withstand the oral fluids, which condemns it completely, while otherwise it is almost ideal; and then another material possessing largely the ability to resist the oral fluids, on the other hand, lacks in other directions, which renders it quite deficient in comparison with the ideal requirements. So far we had the commendable attributes of the gutta-percha. Let us view the non-commendable ones. Gutta-percha is deficient in two respects,—non-resistance to attrition and leakage. The first is an irreparable fault; the second is of no detriment whatever, except-



ing the slight clouding that results to the tooth. The grave deficiency of gutta-percha presented in its failure to resist attrition necessarily restricts the use of it to such places as are without attrition. Few as the places are for the legitimate use of this material, yet when they arise we have the assurance that its employment will save the tooth as no other will. Then, again, cavities in soft-structured sensitive teeth, even though they implicate the coronal surface, may yet be filled with gutta-percha to advantage. The renewal is less worthy of consideration than the tooth-saving quality. And last of all we consider amalgam, because, of all the materials we have for filling teeth, amalgam is *the material*, possessing the greatest number of attributes from the ideal standpoint, and *the one material* which, through choice, we alone could select with which to maintain a practice. There is no material we have to-day which can be employed by itself in a practice and do one-half as well as amalgam, and no greater argument can be adduced for it.

This highest position assigned to amalgam must be adequately sustained, or else it is forced to a lower rank. The same line of argument that demonstrates gold cannot save soft teeth; and that gutta-percha can do so shows that certain amalgams can do the same. The molecular rearrangement of matter and incident motion when two particles are brought in apposition with each other, which upon analysis proved to be analogous with the disintegration of tooth-structure, and which under condition of gold and tooth-structure is greatest, because of the greater rearrangement of matter consequent upon the introduction of foil into the cavity, so under the condition of amalgam and tooth-structure this molecular rearrangement is considerably lessened, owing to the ease with which amalgam may be introduced.

This established the first important consideration,—tooth-saving ability. Then, too, it must be observed that if any force result from molecular rearrangement, it is invited upon the amalgam, thus saving the tooth, as darkened surfaces of fillings clearly show. The next important attribute which, owing to its absence, renders gutta-percha far from being the material, is resistance to attrition. Perhaps the importance of this attribute becomes more marked as we recognize its absence or presence. Could we speak of gutta-percha as being able to resist attrition, then indeed it would be the material for filling teeth in place of amalgam; but as it cannot withstand attrition, so it is forced to give precedence to amalgam. Amalgam, although introduced in the plastic form, rapidly becomes hard, and

then we can say of it that it is eminently capable of offering resistance to attrition. This establishes its second important attribute. And the third is its insolubility in the fluids of the mouth. Here again we notice the importance of this quality as we recall that zinc phosphate is almost the ideal material, with the exception that it disintegrates in the oral fluids; and that, owing to this fact, it descends to a position where at best we can only speak of it as a valuable adjunct.

Tooth-conserving ability, resistance to attrition, and insolubility in the fluids of the mouth are the three essential qualifications of a material, the great tripod together enabling a material to maintain the front rank, while without any one, not enabling it to do so. Of the three materials, gold, gutta-percha, and zinc phosphate, each is wanting in one. Gold lacks in the first important attribute,—tooth-saving ability,—and the grounds upon which this rests are in accord with the highest scientific knowledge; while that upon which it is controverted appears as mere assumption, as was shown. Thus we have the choice in accepting between the highest scientific knowledge or an uncertainty as the guide in practice. Gutta-percha is deficient in offering resistance to attrition,—about this there is a unison of opinion,—while zinc phosphate dissolves in the oral fluids; this, too, is universally admitted. As we analyze the worth of amalgam, we must agree it is the material among filling-materials; because it is the only one that has claim to all three highest attributes. It requires no further argument to establish the front rank for amalgam, to the impartial and scientific mind. Besides these three attributes, amalgam bears other recommendations. It is easy to mix and easy to introduce into cavities. Even though any other material could be compared to amalgam from the stand-point of the three highest attributes, if it were not easy to mix and easy to introduce into cavities it would necessarily be compelled to give precedence to amalgam. When we speak of amalgam as being easily mixed, it signifies, nevertheless, the knowing how; different conditions require different treatments; in all cases accuracy and method underlie procedure. The ease of introduction bears more extended remarks; amalgam is easily introduced, providing knowledge is utilized. It is a matter of very little concern, after incorporating mercury with the alloy, to introduce this plastic result into the cavity, but to bring about best results is another matter. It necessitates accurate preparation of cavity, and accurate manipulation of material. Many early failures could be attributed to want of knowledge in preparation of cavity.

The ability to soften after setting and reuniting with a fresh mix is worthy of consideration. Very frequently complications render it expedient to remove a filling, and yet such removals are attended with severe pain, unless performed in an exceedingly gentle manner. Drilling out fillings under such circumstances, as would be the only course were gold the filling, is unnecessary where we have amalgam fillings. By a proper manipulation of soft amalgam, such fillings are easily removed and the pain incident to such removals necessarily lessened. Amalgam, being far from the ideal material, thus possesses qualities that are undesirable, and first is shrinkage or leakage. Here, too, we may add that moisture, external or internal, is associated with discoloration. As noted before, the molecular rearrangement of matter upon particles coming in contact with each other and consequent evolution of force, being analogous to the disintegration of tooth-structure and formation of a current, the disintegration is lessened when the force evolved exercises itself upon the filling. This is what we have when a darkened surface displays itself upon the filling; in so much, then, it is advantageous.

Conductivity is another charge against amalgam. Serious as the objections are to it, the same must be made against gold. Although the conductivity of silver is greater than that of gold, the combination with other metals diminishes it considerably; so that it is less than that of gold. Then, again, pulp-protectors are more readily adapted in operations where amalgam is employed than in those where the filling-material is gold. The conditions under which each is worked make this evident. No further comment can be made against amalgam. Clearly it has been shown that among our filling-materials it is in the front rank. The work from beginning to end has for its sole aim the construction of a scientific basis for dentistry; and that basis begins with the acceptance of amalgam as the material of all our filling-materials. Appearances are sacrificed for tooth-salvation. That is the practice with the followers of the scientific in our profession. Gold enthusiasts accept the contrary. Their basis is æstheticism. But science works with a wonderful hand. Doctrine and practice are set aside when it proclaims the truth. It has begun its work in dentistry, and ere long we shall see its full exercise. We claim that until some new material possessing all the attributes of the ideal filling shall have been evolved, amalgam must take first rank.

A NEW ERA IN DENTAL PRACTICE.<sup>1</sup>

BY W. G. A. BONWILL, D.D.S., PHILADELPHIA.

MR. PRESIDENT,—Through your courtesy I am with you again, to reveal the silence of years which has culminated in what I am pleased to call "A New Era in Dentistry." Forty-five minutes is but a moment, which you accord me to condense forty years of active labor and practice. I cannot blame you for the restriction, as I have always written exhaustively and hours have been consumed by me, leaving no chance for discussion at the same meeting. I will hold to your order, and leave for the future other chances for details and the consummation of the work, that my efforts may not have been in vain.

The great Master once said, "Neither will they be persuaded though one rose from the dead." The profession of dentistry, as that of medicine, is demanding, "What shall we do to be saved?" We are in the light of the waning days of the nineteenth century, asking each other for some system by which we can be saved the humiliation of failure in dental practice to save the human teeth, one upon which each and all can rely.

Before we can attain to any true system that shall work universally, as in the laws of interchangeable mechanics, we must accord to some one the right from a life of precedents to be umpire in his line of work.

The title of this paper is an assumption, and all I ask is to follow, and for once get out of the old ruts and walk upon the broad plane of liberality and common sense, and with unselfish eye and charity calmly act and show that something good can come out of Nazareth.

Every journal bears upon its pages the desire of men to flee to a practice that will bring universal good results. Let us ask where are our failures? Are they in men or things or materials? Are they in false education? Is it that new difficulties arise to baffle every past partially-successful effort? Have we really been successful in anything we have done to insure us in following the same old cause? The cry is for new light and new methods. If the world knew how few teeth are saved by us for any number of years they would not spend time, health, and money, but give up to the juggernaut of destruction, and extraction would be the rule,

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<sup>1</sup> Read before the New York Odontological Society, May 15, 1894.

even with the wealthier classes. The poor and medium classes have had to give up their teeth in early life because of failure upon failure of even the best men. Then it is a fact, dentistry of the present hour is not near the goal of perfection in practice we long for. Why is it? Is there any relief? When shall we commence in our declaration of failure?

*First. Men.* With all the vaunted advantages of colleges everywhere, how few who enter their sacred precincts are fitted by nature, general education, special talent, surroundings, or by long family precedents. Could we but be as true to principles and bold to assert as was Plato when he had inscribed over the garden-gate to his studio, "Let none enter here who know not geometry," we would then have some hope for the future.

Any one can be taught to fill a cavity with the instruments and material at our disposal, but when to do it and how it should be shaped to insure its future usefulness is quite another consideration. We must not teach men that our art is solely to allow teeth to decay and fill our coffers from nature's weakness. Are you prepared to-night to lay down your life as the missionary and for the good of humanity attempt to save a tooth in its purity whether fortune in gold favor you or not?

Are you ready to ignore self and be the benefactors of your race, and adopt a system that promises to save more teeth, more pulps, give greater beauty, and more usefulness? If not, then step aside.

Medical men can well ask for "preventive medicine," for every honest M.D. soon learns to give less and less medicine, and rely not only on Nature, but in knowing the laws of hygiene, even if he be dethroned for his empiricism.

We, as dentists, have an entirely different field, for we have millions coming to us where no law of prevention can be applied. We can only save and restore the lost structure by our cunning and art.

With the rising generation, we can do, if we have a system to prevent the ravages so universally found in the human race, that which will preserve a much greater number in their purity and also check decay without filling with gold and other materials, and drive from our practice artificial substitutes in the majority of cases.

This leads us to a most important matter,—ignoring the "greed for gold." If we are ever so perfect in our manipulation and able to preserve, yet if we do not have that charity to purge ourselves

from the "lust for gain," and do for others as we would do for our own families, it will not bring us success at the end of our journey.

Let us take up the general causes of failure. We cannot ignore the almost utter worthlessness of tooth-structure. This we will call the "predisposition." My experience is that we are more degenerate every year, and the fight is harder to save teeth. It requires wisdom, foresight, and skill to dare attempt the anticipation of caries. I have attempted to make the effort. *True, anticipation, as a general rule, cannot be relied on* by the average dentist. But there is much that can be done to check caries in its very incipency and that without filling.

The materials as substitutes for lost structure we will now take up. Gold is acknowledged by the profession generally to be pre-eminently the best, and we want no better testimony than to look into any and every mouth and behold gold, gold, gold. Fillings no larger than pin-points and heads dotting every valley. Men talk and write gold, and yet they deplore it does not save. They ask for the reason, why? The "New Departure" said "*never use it*." Here are two extremes, and neither has shown why either should be practised. You ask for testimony. I refer you to the many kinds of gold and preparations or forms of gold, each manufacturer claiming special features for success. The immense quantity of it used. The cases that have been filled and refilled. I filled a superior central incisor last week with Abbey's gold that had been filled fifteen times before. There was left for me a tooth with living pulp with the palatal surface one-half gone and both mesial and distal surfaces involved to the cervix. Think of it! None of you can deny that gold is the idol of the profession, and a man who talks against it is risking his reputation.

Gold, *per se*, is good for preserving tooth-structure. Compatibility has nothing to do with it. Adaptability is all of it! If tooth-structure is worthy as a base and a man knows how to line the walls of the cavity, it will preserve, provided the cavity is rightly shaped and the contour is given such form as to preclude any possibility of the active causes of caries. There is no greater error made than to suppose it is necessary to have various qualities and forms of this metal.

Make to yourself an idol in this metal and, in spite of the manufacturers, follow it; learn to manipulate one kind, and you have all you can ask, and there will be less failures. But, the sin is not only in seeking for some better form of gold, but in learning

how to use but one or two, and have the conscience and honor to confess that the fault is in yourself, and discriminate when and where it should be used. They tell us it quite always fails at the cervix, and, to attest this, they reproach the gold and use amalgam or gutta-percha at this point. It is not the gold, but it lies in you and your judgment and conscience. Franklin showed he was a philosopher when he said he "would not give much for a mechanic who could not bore with a saw and saw with a gimlet."

Some dentists have piled up around them every new instrument that comes out,—every new plugger-point with serrations of greater or less depth and extreme fineness and all sizes,—every form of mallet from the thud blow to the most approved power mallet. And withal, they fail, but few recognizing the fact that perfectly smooth points will do the whole business perfectly in adapting one fold of gold to another though perfectly burnished.

Tin and gold and hand-pressure is another proof of gold's failure when used alone. I could multiply proofs of failure, but enough,—gold is a failure!

Take amalgam. Look at the tons of it used; yet, so many men say they do not have it in their office.

Do you ask for proof of failure?

Take the craze for "copper amalgam." What a curse it has been to the profession and their patients! I never used it once! I saw what it was when I looked into patients' mouths when I was abroad. Had they known what proper contouring was they would never have used it so universally in all cavities.

It has been a stench in the nostrils of nearly every American dentist.

Has amalgam any good qualities in itself? Have we any good alloys?

How many men know how to use it and get the best results? What curses have been heaped upon its hallowed head? Where is the man who dares say he uses it? Anathemas come thick and fast from the M.D.'s of both old and new school as if they were the Supreme Court to sit upon its merits.

Several years ago, at one of the first meetings of our Odontological Society of Pennsylvania, one of its oldest and most prominent members went so far as to place on record in the Proceedings,—  
"All men, falling away from manipulative ability, lean on plastics." To-day he is experimenting to find an ideal alloy to help him out in his failures with gold. How sad such a record! Who among you so mean as to deny using it and without "apologizing."

I say it is one of the grandest filling-materials we have,—and while I have spent nearly thirty years in inventing power mallets and special smooth oval points for gold work, I confess I throw all aside very quickly, and while I delight to wield the electric or mechanical mallet in distancing time and space with gold, yet I use more amalgam to-day than ever before in my life.

I am thankful I had the courage and principle to stand by it, and recommend and show how much could be done when condensed under Japanese bibulous paper. To me it is a sheet-anchor for the class of cases every day coming to me from others. If you use amalgam and wish to make your practice a success with it, learn how to manipulate it and prepare your cases for its adaptation.

Oxyphosphate,—what of it?

Is it good as a permanent filling alongside of gold or amalgam? Is it a failure also?

What does the profession say of it?

Everywhere you hear the cry, It gives way at the cervix in all cases and soon wears away, and is not fit for contour or permanent work. It is not to be relied upon!

If this be true, then it is useless to place it in carious teeth.

That it will preserve tooth-structure from further decay admits of no doubt whatever?

That it will preserve the contour of the tooth is certain in the bulk of cases!

That it will not destroy the pulp in near contact with it is equally sure.

That it will preserve tooth-structure with nearly all the decay left in the cavity and without much or really any shaping is incontestable, which, further on, I will show for a fact that I am willing to stand by and form a part of the new era of which I am here to speak. It is beyond value when you know how to mix it, how to manipulate it, how to shape it; how to treat it before you remove the dam or allow it to get wet; how to treat the phosphoric acid, to keep it from crystallizing, insuring you thereby a better result in every way; and when proper precautions are taken with these fillings, how inestimable are the results, and beyond cavil and doubt!

I cannot say too much for it,—a good article. But, just here let me say that, when you can get a good article use no other kind in the mouth; as I forgot to tell you of amalgam, as with gold, use one kind only, that will work as well under water as above the



surface. The oxyphosphate, of course, will have to be kept absolutely dry to be a perfect success.

In nearly every sense I know of nothing so important as pink base-plate gutta-percha.

To teach you how I use it for the preservation of the human teeth, both temporary and permanent, will be the foundation of a system that, if I have had any success at all, I can attribute to this one article as much as or more than any other filling-material.

In conjunction with this I cannot overestimate the value of the discovery of the laws of articulation and the articulator that bears my name, and of which I am more proud than of all my other productions. Without knowing what I do of articulation, the gutta-percha might never have been seen in the same light by me.

Let us review, now, before I enter upon this simple revelation of truth, what and wherein are our failures.

I told you, poor elements in tooth-structure as the grand predisposing cause of failure.

Worthlessness of tooth-structure as a very great cause of failure, let us be ever so competent and with the best of materials for restoration.

The materials as substitutes for lost structure,—gold, amalgam, oxyphosphate, gutta-percha, and tin,—and how failure comes from each and all.

The failure that comes from not understanding the laws of articulation, and which shows how the loss of one tooth affects all the teeth of both jaws.

The failures that result from the indiscriminate cutting of approximal surfaces in filling and the great change of relationship between the upper and lower dentures.

And the failures that ensue from the want of a definite system in knowing what to do in the keeping of the original articulation, and, when lost from bad dentistry, restoring it again to its proper relations that each tooth will bear its exact burden and no undue pressure be brought to bear upon any one.

The importance, finally, of those laws and this system in the prevention of recurrent caries and the blotting out of the greatest cause for pyorrhœa alveolaris,—which comes largely from undue pressure and use of the teeth thrown out of arrangement by non-restoration of contour.

I cannot enumerate all the causes as now acknowledged by the profession. Look into every journal, go into every depot, talk

with every dentist you meet, scan the proceedings of every society, go where you will, and we can infer from it all.

Dentistry is a failure because it can neither anticipate or prevent decay superficially or arrest it when substitutes are made to take the place of lost tooth-structure.

We have labored in vain, and I am invited here to tell you whether I am satisfied with the practice I have instituted after forty years of servitude.

To say that I am really satisfied is not true. But I am conscious that my practice shows that I not only anticipate successfully, but preserve teeth superficially decayed without filling, and, when too far gone for this practice, then the conscientious use of the materials we have at hand enables me to snatch from the ravages of the "tooth of time."

Yes, I am happy to tell you how much can be done to rescue our profession from its perilous practice. But, I know you will not adopt what I tell you! Or at least the bulk of dentists will not, for they will fear starvation.

If you can have the courage to charge a patient as much for tin, amalgam, oxyphosphate, gutta-percha, or beeswax,—which is a valuable material to save trouble,—then you have accepted the highest creed I offer you in my "New Era." Unless you can dare to face the public and say to them brains must be paid for, and all our operations are upon brain-work as the standard of price, then do not accept my creed,—go on as aforetime. Hobbs, the celebrated locksmith and maker of the first complicated bank-locks, which were marvels of ingenuity, was brought before a bank committee to have him show cause why he asked such high prices for his inventions. They had him take the lock to pieces, and inquired what each piece would cost to duplicate it. When the sum total was made they found it did not foot up the price Hobbs asked for the completed lock. How is this Mr. Hobbs? He then looked over all the items and said to them, "Gentlemen, there is one item you have left out." They could not tell what it was,—when, to their chagrin, he said, "Brains."

But with this blot upon my career, "high charges," I am proud; and, if any one thing has added to my success above all else it has been in daring and boldness to make people pay what I believed my brain as a machine was worth.

I often say to my patients now, when speaking of prices and they want an estimate made, I cannot do it, for "I have no more right to cheat myself than to cheat you."

Then, I am sure you will agree with me that this first article of my creed is worthy of following. If not, then do not listen to my simple system of practice.

It is not as manual laborers we can show our highest skill! No: one piece of timely advice—the extraction of one tooth; the teaching how to use a brush and what kind to use; and in many ways, where no labor at all is performed—is worth hundreds of dollars, and besides, a deep gratitude for the salvation from vandalism and sacrifice of Nature's most beautiful pearls and God's grandest piece of architecture.

Let us all dare to do right, even if we get no immediate compensation further than our own approving conscience.

Let us all dare to stop when we are in doubt, and the kindly consultation with another brother practitioner may be of the greatest value to us and our patient.

If we must link ourselves at all to the medical men, let us emulate their example in one thing at least,—anticipative medicine, or, as they have it, "preventive medicine."

As I have previously told you in this article, I have held opinions for many years that with every disadvantage impeding our course we can anticipate and cheat the "tooth of time" of its ravages. Yet it is a dangerous remedy in the hands of ignorance.

Unless we can have sole charge of patients from the second year on, and no one else to interfere, we cannot hope to do our fullest duty and found a practice for all men to follow.

Ignorance, stupidity, and downright dishonesty give us more trouble than we like to admit.

I have told you only of a few of the causes of our failures. One, above all the rest, faces us, and a wail is sent up everywhere. "Recurrence of decay at the cervical border;" no man yet has dared to say he was conqueror.

The next most treacherous is what is known as pyorrhœa.

I never use gold in the temporary teeth, seldom amalgam or tin, save on grinding surfaces, where cavities are very small or very large and no pulp involved in the part, and oxyphosphate very seldom, and only where I can keep it perfectly dry. Not that any of these articles are not valuable, but the preparation of cavities and the situation of decay, the near approach to the pulp of nearly every proximal decay, and the age of the subject preclude their use. Never demoralize any youthful client by much excavation or formidable show of instruments, or by slow, sluggish movements. My aim is expedition; as few minutes in the chair as possible; in-

flicting but little pain and inconvenience,—gentleness, kindness, and yet positiveness.

My greatest ally as the filling-material is pink gutta-percha, such as is used for base-plate, and further on you will see how far I use it in the treatment of the permanent teeth. Aside from its use for a stopping on all approximal surfaces, there is one grand object in view to be ever held in mind, the importance of the position of the first permanent molar when it emerges. Unless this base column, or abutment if you please, is not kept well back towards the ramus then *irregularity will come to the incisors*. It is not enough to merely stop decay and stuff in amalgam or oxyphosphate; we must keep the temporary molars from approaching each other more than normal, and prevent the alveolar processes from encroachment and absorption from direct pressure of the roots of the temporary molars, which is invariably the case when the approximating surfaces are cut by caries and allowed to trespass on each other. We cannot use a separator here to gain space; we dare not cut or shape the cavities for a metal filling for fear of the pulp. What is to be done?

If possible, as soon as the least decay is noticed on the approximal surfaces and you can get in from the crown or on the buccal sides with the least excavating, by hand or machine, if it must be used, whether you can keep the cavity dry or allow it to remain moist, stuff in the gutta-percha forcibly between the teeth, smooth, and let alone to watch every three or six months. Where the cavities are large when you first see them, remove no decay over the pulp. Break down all superfluous walls, saturate with carbolic acid or creosote, force in a lump of the gutta-percha by filling all space as one filling, and let it go until the teeth have become so far separated by the act of mastication—not by expansion of the material—as to have replaced with another or a patch on the surface. Now, here is the point I wish to make that you have never recognized as a factor, because you have ignored the laws of articulation.

By this means I save from future decay and the risk of pulp exposure; but, above all else, I give a condition that enables the child to use with impunity every part of the jaws with hard or soft food, and no pain or fear of it, which no other plan could offer. And, above all this, I drive the first permanent molar so much farther back upon the ramus that, the nearer it is to the condyle or point of motion, the wider it keeps the jaws apart at the incisors, and prevents absolutely the too great encroachment of the lower

upon the palatal surfaces of the superior incisors, which, if allowed, would destroy normal articulation,—make too deep an overbite and underbite, and, withal, cause an overlapping of the inferior incisors and the full use of the jaw teeth, because, in the lateral movements of the lower jaw, the incisors would strike first too long before the molars could come in contact, and, really, only the up-and-down movement would be attained.

This you could never know, nor can you appreciate now, unless you fully grasp the laws of articulation. This has never been taught, and, save a few followers of my special friends, is not practised.

This was a revelation to me when, in 1858, the articulator was born. And, as soon as the pink gutta-percha made its appearance, with rubber plates for trial or base plates, before they were brought forth, I struck upon this treatment and have followed it ever since; and the results have proved I have but few cases of irregularity in my own immediate practice, and those but simple ones, and seldom a pulp exposed for treatment, and but few demoralized subjects, and a brighter future for the permanent set, with plenty of room and to spare for them to come in. Should decay occur on the anterior approximal surface of the first permanent molar, I prevent its spread and in many cases anticipate or treat it superficially; and, if to fill, do so when I have all the room I want,—but seldom with gold even then, as I do not know the exact position the second bicuspid will take; besides, most of the cavities are very small and not susceptible of contouring over all the approximal surface, which has to be done if we contour at all on any surface. From the temporary incisors of children I generally remove caries when small, and do not scruple to fill with amalgam if they need filling. I have never used the dam for any child except when the permanent molars required filling.

Lastly, to detect the incoming permanent tooth when the temporary one shows no sign of its approach, I, at the proper time, use an exploring needle under, or in some cases directly through, the gum to feel for it. It is the precursor of events, and saves much irregularity and fear. Without this precaution many temporary molars that become fastened between the permanent molars and first permanent bicuspids would remain in for years too long. So much for the treatment to the twelfth year. Gutta-percha is my sheet-anchor.

In the permanent incisors anticipation is generally adopted; if decayed, oxyphosphate or pink gutta-percha is used, never gold. I

seldom have any fillings at all in these teeth. The sixth-year molars on buccal surfaces are generally smoothed and decay arrested, or, if to be filled, pink gutta-percha. It is impossible to save every tooth without filling; yet, even with the worst of these cases, *superficial* decay can be arrested and thousands of fillings saved, and our art made a comfort and a blessing.

You all admit that recurrence of decay at the cervical border gives you the greatest difficulty to surmount, and as yet you have not reached the cause nor the remedy. It must be admitted that if this one thing alone can be mastered, we have overcome our most powerful foe.

It is a fact not to be denied that every dentist cries out for some method to prevent recurrence at the cervix. This is positive proof that every one has his hands full of proximal cavities from the cuspid back. Every one must admit that contour fillings alone have been the only help or partial cure, although it has to be repeated or requires oft patching.

A case presents where caries have run wild. Not an approximal surface scarcely but is involved. No pulps quite exposed, but threatening. Every tooth has been filled and refilled, and by more than one dentist. Contour has been attempted. Where the fillings of gold remain they are so undermined there is nothing but utter annihilation unless all are removed. The teeth from their loss of proximate surfaces are all out of articulation, which can be best seen by taking an impression and putting the casts in my articulator. Look closely at the cervix, and you will find the root of each so close that no thread can be forced through, and the decay is far up under the cervix. Look further and probe for the alveolar process, and not a vestige of it remains for a quarter of an inch up. Look also to the second molar where the first has been extracted, and on that side the process is gone far down and nothing but loose gum tissue remains, and is constantly receding, and whenever a tooth has been lost the process about the cervix absorbs as the body of the jaw absorbs.

In this state of affairs you put on your dam and separator and you obtain a slight widening and at once fill permanently the excavated tooth. No attention is paid to the articulation of the teeth. You have no desire to wait, and you rush on headlong to fill and get your pay. The rest of the teeth are left without anything in them until one by one you have had your patient at least twice a week for months, two hours or more at a sitting, until they are exhausted and condemn dentistry, and while you are rushing

through to complete every cavity with a filling you have done nothing to prevent further rapid decay, and pulps become exposed and the patient has to suffer.

Now, I know this is the case with nearly every man's practice. I see it every week, and I know from personal contact in conversations with patients of others who have not come to me for treatment.

Now, you can do better than this and not only retain your patients, but bridge over time as well as space and fill and treat at your leisure.

I will take the same mouth just illustrated and without placing in one single permanent filling of any kind of metal treat it with pink gutta-percha alone, with a little of the white as a facing, where necessary. I cut out only partially the cavities on one side of the jaw or jaws, always exposing every grinding surface where the approximal is gone and make compound by running all of the cavities into one, seldom leaving any approximal cavity to stand alone but opening it into the grinding surfaces. This is a cardinal principle with me. There is one surface or border I complete at once, and that is the cervical, so that I never have to touch it again, and this I cut so far up as to not only remove all caries, but where I know the gum and process will grow up and over it. This is finished, and to enable me to do so I forgot to say I never put on the rubber dam in any case until I fill permanently, when the cervix is firm and will admit of its adjustment. It is easy to stop the blood with perchloride of iron, creosote, or any styptic.

And now for the further treatment. Into all the spaces I have made on one or more sides in one or more teeth I place great pieces of pink gutta-percha, and, with no separation between them in any case, stuff the whole intervening space, trim, and let alone. This I do until every place is filled in. I dismiss the patient, and have him call in three or six months or a year, as I may please; and, as I find the teeth wide enough apart for a plus-contour filling, and the alveolar gum border and process is in perfect health, and the process has grown up to the gutta-percha, then I fill only those that show that they are far enough apart at the cervix to permit a healthy, full process to grow, in order that the gum will have proper substance, and cleave to the root and cover up and over the margin of the filling at the cervix. In this, I tell you, is your future security at the alveolar border.

No one has ever called attention to the difference in width of the approximal spaces at the cervix for the bicuspid and molars.

The gutta-percha should remain in until double the width or space is gained between the molars than the bicusps, on account of the greater size of the molars, where more proximal surface is in contact and no room left for cleansing, unless the spaces are very much greater than normal, and the contour made to suit this issue. Here is where you will say, "You will destroy the articulation and cause greater strain on the fillings and also the teeth." No; you are mistaken. When the whole of these proximal surfaces are filled with the semi-elastic stopping, and the act of mastication set up, the teeth that at first are out of the normal position and only touch on part of their crown surfaces are now allowed to readjust themselves; as the gutta-percha will give where the greatest pressure is brought to bear, and where least resistance is offered, no change occurs. I am not mistaken in this. Try it, and watch a few cases if you cannot believe me.

This method is a test for any further treatment, which, if needed, can so easily be done. It permits of weeks, months, and years before the permanent filling need be introduced. No danger of decay, none of loss of structure from fracture. And, in fact, you can dismiss the patients thus treated with the greatest indifference as to the issue. Do you ask whether I charge for all this work, and when I send in my bill? I charge for even my thoughts as well as my work. My patients never object, but often beg me to leave in the gutta-percha.

Thus I practise with all; and I am happy in this, knowing that I do far more good, am not troubled about immediate root filling,—fillings falling out,—“conservative treatment of dental pulp.” Nor does pyorrhœa ever invade upon my domain of original work, because I know the value of articulation, and how to make every tooth perform its individual and collective function, and no undue pressure given it to press or work its life out of it and give rise to the denudation of the peridental membrane; nor is the food ever found pressing up into the cervical border and remaining, nor the cervix so weakened by want of contact with firm alveolar processes, and the gum is left to hug the root at this vital portion so tightly that nothing ever creeps in to cause recurrence at the cervix.

Any dentist who allows his original patient who follows orders to have pyorrhœa should be sued for damages. See that no food presses on the gum border; see that no tooth is unduly pressed and contorted by false articulation, caused by improper width and contouring; allow no biting of threads, cracking of nuts, biting of ice upon one tooth only; or, when a tooth, or teeth, has been lost, see that the articulation is restored,—and, my word for it, gout or no



gout, syphilis or disease, pyorrhœa will not come, except filth and malaise of one or more teeth.

Gutta-percha used as matrices for gold, amalgam, or oxyphosphate fillings I will not dwell upon; you need nothing better. For holding teeth in position after correction where there are cavities in both, I need only mention it. As for assistance on the temporary and permanent teeth, to keep the ligature from slipping down on the cervix by carrying the ligature through it; for fastening pins into roots for crowns; as a medium between crowns and roots to prevent further caries; as a protection to all roots when a gold crown is used; and, in fact, as a factor in our practice, there is nothing to fill its place.

In only one instance it will not do. Never place it in contact with an amalgam filling, especially when it is covered up over a nearly exposed pulp, for it will oxidize the amalgam and discolor it and make it valueless at the margins. White gutta-percha is not so. The sulphur in the pink will do the work; hence I say this contact with amalgam is a failure. I am in love with it, and without it I would be lost.

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## Reports of Society Meetings.

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### NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, May 15, 1894, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, with the President, Dr. Brockway, in the chair.

The minutes of the previous meeting were read by the Secretary.

#### INCIDENTS OF OFFICE PRACTICE AND CASUAL COMMUNICATIONS.

*Dr. Perry.*—At one of the recent meetings, when the question of the erosion of teeth was being discussed, it was stated by some one that erosion, as we understand it, never occurs on the lingual surfaces of the teeth. I believe the gentleman was Dr. Lord.

*Dr. Lord.*—I did not mean to say that it never occurred, but that I had never seen a case.

*The President.*—Were those eroded on the labial surfaces?

*Dr. Perry.*—Not at all. They were perfectly clean and clear on the exterior surfaces.

*Dr. Jarvie.*—I do not remember ever to have seen a case of erosion with the grooves on the palatal surfaces of the teeth, but I have a set of three models, covering a period of seven and a half years, in which the incisor teeth had wasted away from erosion, and had wasted as much on the palatal and approximal surfaces as on the labial. They had wasted much more at the cutting edges than near the gums. Before erosion commenced the two centrals had had the pulps removed and gold fillings inserted in the openings made upon the palatal surfaces, and the models show just how much tooth-substance had wasted away, because the gold stood out from the teeth.

*Dr. Kimball.*—I had a curious case some years ago, which, while not in the same line, suggests itself to me at this time. A lady who had had excellent teeth came for her annual examination, and I noticed that her teeth were disappearing on the inner side. She had erosion of all her teeth, on the inner side only, as far back as the bicuspid. They looked as if they were dissolving. Questioning her pretty closely, I discovered that she was taking hydrobromic acid for headache. I asked her to bring me a sample of the acid of the diluted strength which she was in the habit of using. Covering a tooth partially with wax, I put it in the same solution, and in twenty-four hours all the exposed enamel was eaten away. The front teeth, upper and lower, where the tongue rested against them, were the only ones affected, except a little of the bicuspid; back of that there was no loss. If you ever hear of a physician prescribing hydrobromic acid without extreme precautions, you should bear this in mind.

*Dr. Walker.*—I have just shown the cast to Dr. Bonwill, and he says it is not from erosion, but from the brush.

*Dr. Bonwill.*—It is taking me away from my course to ask me about a subject like this. That which is called erosion I do not admit to be so in the way in which the term is generally used. I have seen a great deal of the injudicious use of brushes of a form which should never have been made for the use of human beings. I have yet to see a case in my practice which I can attribute to erosion, but it is generally the action of the brush upon the teeth.

People sometimes rub their teeth just as thoroughly on the inside as on the outside. Sometimes the gum and the alveolus have actually been rubbed and scrubbed away through the use of the brush. There is a great chapter to be read on this subject. I have

never spoken in public about it, but I am opposed to the idea of erosion. I can show it in many cases. I have something in my pocket now that I did artificially, and you cannot tell whether it was done with a brush or acids, or what. I will tell you afterwards about it. I exhibit a brush which I guarantee will never produce this trouble.

*Dr. Jarvie.*—Does Dr. Bonwill mean that there will be no erosion or no wasting away of the teeth in mouths in which such brushes are used?

*Dr. Bonwill.*—If this brush is used, nothing of the kind will occur.

I want to say something about a point made by Dr. Howe some time ago in regard to secret recipes, why men do not give them to the profession. If he had my experience with patents, secret remedies, and nostrums, he would know that it is no use to give to the dental profession at large any invention, or to give them anything whatever, because what is everybody's business is nobody's business. Take, for instance, oxyphosphates. When the matter was first published, it was taken up by almost every manufacturer in the country. We tried one after another, and there has been an immense failure. If we could have one man upon whom we could depend, we could do something with it. I have in my pocket a piece of tin-foil which is about twenty-five years old. It was registered chemically pure tin by S. S. White himself. To-day it is simply worthless. Look at the immense number of fillings that that poor material has made. Therefore it is best for one man to take hold of a thing, and not for the whole world to go at it.

There is one other thing that I wish to speak about, and that is superficial decay. No one of you will deny to me that superficial decay can be cut out so that it will never occur again. I meet many cases, notwithstanding the close watch I keep on my patients. I have found by putting on the dam, making a partial separation, so no capillary action can take place, if I dry them thoroughly with heat and then put chloroform on those cavities, so as to take out any surplus material there, I can saturate those cavities with paraffin, and they will not decay. Take any of the old pulps that are so porous, and decay will take place again. After you get them thoroughly dry, soak them with heat and paraffin, and there is no possibility of their decaying again. If you shape your teeth properly, this will soak into the teeth and prevent further decay. Nitrate of silver is used. It is very good, of course, but it blackens the teeth. In the majority of cases, if you will let them go as

long as I do with gutta-percha, you will find that your work will be successful.

When my patients go to Europe I give them a little piece of gutta-percha, and tell them if they need to go to an American dentist, they should give him that with my compliments, and tell him to put it in until they come back.

I have no trouble about the conservative treatment of the dental pulp. When men tell me they have trouble, I believe that they have exposed more pulps than they ought to.

I never put in a gold filling before I put the dam on and soak on paraffin wax until there is not a single place where it will not go in. It is impervious, and hermetically seals every part of it. There are many places that are a little too deep in superficial caries that I cannot cut out, and where I would not use paraffin wax.

*Dr. Howe.*—I would like to ask Dr. Bonwill whether he uses heat in melting the paraffin wax?

*Dr. Bonwill.*—Yes.

Dr. Bonwill then read his paper, entitled, "A New Era in Dental Practice."

(For Dr. Bonwill's paper, see page 562.)

#### DISCUSSION.

*Dr. Jarvie.*—I would like to know if Dr. Bonwill calls the use of the gutta-percha in this way the "new era"; that it is something entirely new, and only practised by himself, using the red base-plate gutta-percha and allowing it to remain there.

*Dr. Bonwill.*—That is a part of it.

*Dr. Jarvie.*—We are very much indebted to Dr. Bonwill for his paper in which he describes a certain system of treating decay as new and as original with himself, but the essayist is not the only one who has been practising that system in a certain class of cases. For young people with soft teeth I have been in the habit of doing that very same thing, cutting out the approximal decay and filling in solidly with red gutta-percha, and allowing it to remain there in many cases for a year, and sometimes two years or more, according to circumstances. Upon the removal of what filling may be left, I find the structure of the tooth under the gutta-percha very much harder, and in a condition to receive a metallic filling, generally gold. I have done this for years in cases of young people and poorly calcified teeth, and I think you will find that there are many gentlemen in the room who have done that same thing. I do not consider it new or novel.

*Dr. Lord.*—The hour is now late, and as there is much in this paper that some of us will not agree to, particularly the use of amalgam to the extent that it is recommended, we do not want to have it go out to the world without being properly discussed and the questionable features pointed out. We should take care of the bad things, and the good things will take care of themselves. This is an old adage, but one that generally holds true.

I think it would be wise to postpone the discussion of this paper until another time.

On motion of Dr. Howe it was decided to postpone discussion until the paper had appeared in print.

*Dr. Bonwill.*—I would not have you understand that I was the first man who ever used gutta-percha, or the first one to use oxy-phosphate. That would be ridiculous. I call your attention to the use of these things in a way in which you have not used them. No man has separated the teeth as I have done. The best evidence of it is in the separators that you use, and the way you do it. There is one thing that I do tell you that you have not noticed, and that is in regard to the placing of the first permanent molar. The farther back you keep it, the less regularity you have. It is a grand point. With all of your intelligence, you have not studied that in connection with articulation.

*Dr. Bogue.*—I take it we all have different kinds of practice coming to us. The teeth have been so treated that Dr. Bonwill sets himself to work to find a remedy for the treatment. He uses gutta-percha as being the best separator that he can find, and, having a great many of these cases, he waits for three or four months, or even a year, until he has space enough; and then he has a position of teeth, upper and lower, in their relation to each other that permits him to contour, and to contour in such a way that the teeth are no longer painful and no longer accumulate food between them.

On motion of Dr. Lord, a vote of thanks was extended to Dr. Bonwill for his kindness in presenting the paper.

Adjourned.

JOHN I. HART, D.D.S.,  
*Editor New York Odontological Society.*

## ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

At a regular meeting of this Society, held March 10, 1894, at 1228 Walnut Street, Philadelphia, President Darby in the chair, Dr. C. N. Peirce read a paper on "Pyorrhœa Alveolaris," and at the close cited two or three cases confirming the statements contained in the paper.

(For Dr. Peirce's paper, see page 501.)

## DISCUSSION.

Dr. Brubaker, on being called upon by the President, said, "There is nothing, Mr. President, that I can add to the suggestions made by Dr. Peirce either in reference to individual or to dietetic treatment; both are based on the well-recognized lines of treatment long since found to be efficacious in the forms of the gouty diathesis. The question has been asked why only the meats are excluded from the anti-gout diet and not vegetables also, especially as some of the latter contain proteid matter in large amounts. The only answer that presents itself, is that the albuminous molecule of the vegetable foods is less complex and not so difficult of assimilation."

In answer to the question of Dr. Kirk as to what was the peculiarity of beans that they were excluded, Dr. Brubaker stated that it was largely on account of the percentage of proteid matter which they contain, and which amounts to 23.7 per cent., though it must be remembered that the proteid matter is not true albumen, but a globulin, and, therefore, not as objectionable as a more complex form of albumen.

*Dr. Bonwill.*—Before I speak upon this subject I wish to make some remarks upon a charge made at a recent meeting by one of the speakers, a guest of the Society, which, owing to my deafness, I did not hear. My views in the paper read were regarded as "elementary." I laid no claim to the matter therein contained as being scientific, but it comprised the substance of what I knew and practised. His remarks on that occasion were unauthorized and unbecoming.

I am not on record for having said one word upon the subject of this evening's essay, notwithstanding it has figured for at least twenty years as not only an incurable disease, but its cause has never been satisfactorily explained. My silence is not that I have had no subjects for treatment, nor that I have no views upon it worthy of notice.

I presume I have had about as varied a practice as any one here, and, while my opinion may be regarded as of little value, yet I certainly have some right, after an experience of nearly forty years, to an opinion. What I claim to know can be demonstrated, and the result of that experience can be shown in the living subjects. Many of us may not be so profound in chemistry—organic or inorganic—as our essayist, yet with the assistance of others learned in the law of chemistry, we may reach nearer to a satisfactory explanation. I am no chemist, and few, if any, of our clan practically know any more.

It is possible that some persons who are troubled with pyorrhœa (I retain the old nomenclature as good enough for me) have gouty diathesis. It may be I do not know the symptoms of gout. There is one thing I do know, however, that when I can take the many cases that have come to me from the practice of the so-called best men in our profession, who have given them up and declared that no one could save such teeth, and restore those teeth to usefulness without constitutional treatment, and have only seen them twice or thrice at most, the gout has not been in my way. If it be a disease, then every part of the membrane should show it and the deposit take place from the very apex of the root; or, more properly, all portions of the tooth's membranous structure simultaneously should be involved. I have yet to see the first tooth where a deposit has been found at the apex or on any portion of the root without the loss first of the membrane at the cervix. Any one who will with exploring needle search each case will see that when a secretion is pouring forth from about the cervix, accumulations of calculus will be found only on the parts where there is no healthy attachment of the investing membranes.

I can understand how the gouty diathesis can be a factor by depositing surplus calcareous salts found in the blood in the mouth, through the numerous glands emptying thereinto, and mixing with the large amount of starchy matter from the food and the mucous secretion from the gums, as the formation of calculi in the gall-ducts and bladder, but never as a predisposing or exciting cause of pyorrhœa. That there is a surplus of uric acid in the blood of gouty patients admits of no conjecture, as I have detected its peculiar odor in the breath and when drilling into the pulp-canal to relieve pus accumulations. If it should occur at the apex first, then all pulps of such teeth would soon become involved, which is not true, however.

Hundreds of cases have I seen where one side of a root has been

involved and stripped of its investments to the very apex, and the pulp at that extremity finally become affected and death ensue.

We often see one of three roots of an upper molar with accumulations, and have cut that entirely free from the others, and they never became affected. It is my opinion that no such accretion could be formed by either investing membrane.

Then you would ask how I treat all my cases; if there is any special way that gives me success where others have failed? First let me say, that in my original practice, or where I have had charge of any mouth from childhood, I do not know of any case where pyorrhœa has ever had a foothold and the teeth lost from such cause. I am aware that this is a bold assertion. But, when I can say that many who commenced with me years ago still make their appearance, some yearly, others not so often, I have no cause to regret what I have done.

Before I speak of the treatment, let me call attention to one factor that has never been noticed, so far as I have kept up with the literature of the subject. False articulation has much to do with the cause. The extraction of one or more teeth early in life makes such a change in the relation of the whole denture that the lateral and direct force brought to bear upon one and all, especially the molars and bicuspidæ, causes the investing membrane to be unduly forced or strained and its function materially lost. The extraction of the first permanent molar in the lower jaw causes absorption of a large portion of the alveolar process on the roots of the adjoining teeth and the gum still in place, yet loose about the cervix, and for half an inch under, where accumulations are found long before any other place, and from this the teeth adjacent are involved. But this is little, indeed, when the whole denture is thrown out of gear, as cog-wheels become by wear and change of relationship. The best evidence I can give of this fact is, that before I resort to any treatment, I invariably look at the articulation and take an impression of both jaws and place them in my articulator, which reveals just what I see in the mouth,—the teeth most at fault.

So long as this is allowed to remain, no cure can ever be effected. Take off the calculus, and still this cause remains to condemn you for your want of vision. As soon as one tooth becomes involved more than another, the offender is at once thrown from the socket and articulation is thrown largely on this one and its antagonists, and the disease becomes magnified until the tooth is lost. Could you have seen this, and with your engine and corundum wheel have



placed this tooth and its opponent in harmony, as you would shove a cog out of place, or one that is loose tighten and make shorter, every time there would have been perfect success. I have often seen cases given up as hopeless by others, when by simply rearticulating them, they have been restored to perfect health for years and with no loss or extension of the disease to other healthy teeth.

So often in mouths where the teeth are far beyond the average, and scarcely a decay to be found in any of them, have I had to combat with loose teeth; not the whole set, but an individual tooth and its antagonists. On questioning the patient I have found that biting off threads or the finger-nails produce the effect of sharper articulation. I simply shorten these teeth, so that they cannot longer use them, and all is well.

A few weeks ago I had a patient whose teeth were given up. They were almost faultless and placed in the process firmly as rocks, save three or four. She told me on inquiry that it was her habit to crush ice between those teeth, and she could not think she was injuring them, and her dentist never asked her as to what she was doing with her teeth. One, or perhaps two, I made her lose. She had very little tartar upon any of them, not even upon those extracted.

Take another case: A man who had lost nearly all his bicusps and molars, except where it was hit and miss, and of no value for articulation, came to me with the left lateral incisor, lower jaw, so tender that cold no longer affected it, but hot water gave intense pain. It had been this way several days. My first thought was the pulp is involved; but there was no decay. Then I looked after the articulation, and I found that nearly or quite all the incising and even grinding was done upon this one tooth and the two upper antagonists, that were much larger and fared better. The first treatment suggested to me was to drill into the pulp-canal and remove the congested membrane. But I simply cut from the labial surface of the inferior lateral and the lingual surfaces of the superior antagonists, and the pressure was instantly relieved; and without even a counter-irritant the tooth began at once to improve, and from that time was no longer a cause of irritation. There was no accumulation on it.

To further illustrate how far false articulation is a factor in the loss of good teeth, some with loads of tartar on them and others none, I will recall a case of a desperate drunkard who had been my patient for years, and there never were any signs of loosening of the teeth and no previous signs of tartar or calculi. In one of his

fits he caught foul an inferior lateral incisor, right side, and in the spasm of his jaw fractured the process on the lingual side. When he came to me for treatment, three weeks after, there were already accumulations taking place on the root, and the crown was quite out of its place and was struck at every motion of the lower jaw. At this time pus was pouring out from every surface, and no shortening of the crown and ligating would retain it and cause it to grow firm again. I had to remove it. There can come a shock to every tissue, bony or soft, that means death whether the system is in health or not. But the bulk of such cases can be saved by regarding articulation and very little interference on the part of the surgeon.

I could multiply these cases and their cures. One more, however, I must notice. One of the upper classes came to me eight years ago in great trepidation. He informed me he had been to not only four or more of the so-called best dentists of Philadelphia, but to prominent physicians and surgeons, and each and all decided there was no treatment which would reclaim those remaining, but one by one they would leave him.

His teeth were as nearly perfect as anything I ever saw,—only one filling of oxyphosphate, and it was to cap a pulp, which was one of those he lost. Two molars in the lower left side and one in the upper, same side, I refused to treat at all. The rest I cleansed, which was done at one sitting, having him two successive sittings to see if any small particles remained and to complete the articulation of those thrown out of position; and that mouth stands to-day as I left it. He comes to me every year, and it requires but one sitting. This gentleman from high living should have been gouty. But, if he was, it did not interfere with the treatment.

Allow me to speak now of another factor which dentists will be reluctant to admit. You may not have thought that bad dentistry has anything to do with this trouble. Well, I am sure it has. If gout has so much to do with this frightful disease, how is it I can take a mouth filled with flat approximal fillings leaving at least twenty spaces between the teeth, and then by keeping them all apart with pink gutta-percha until a proper width is attained, the whole jaw becomes at once easy and quiet, and the teeth again assume their normal position in articulation with their antagonists.

Finally, as the spaces are wide enough to permit the alveolus and gum to get and retain their normal status, I make contour fillings that buckle up to each other so that no food can possibly pass. Try what I say, and you can do what others have not done. I see

contour work, but when it is investigated the teeth were once cut away and allowed to come together; and, instead of taking time to force them apart with the gutta-percha and let the teeth assume of themselves normal articulation, a separator is placed in and they are filled at once, and the gum and process are left pinched and will never be as healthy and firm as when wide apart; besides, the crown fails to assume the normal articulation. Again, when these ground arches are broken into by extraction, the teeth are never so firmly in contact as to prevent food from being driven between them and causing irritation and accumulations, as well as irritation from undue pressure. The teeth will stand an immense deal of abuse, as bad dentistry will testify; but modern life, with its soft food and sweets, with no true legitimate work given to the teeth, weakens the tissues and causes absorption of alveolus and makes the teeth loose, and the gums will not close round them any longer, and secretion will accumulate and pyorrhœa step in, but not true disease. Lastly, artificial teeth are no mean factors in causing destruction to the remaining teeth. Look at the bad-fitting plates with their borders allowed to come in direct contact with the cervix of every tooth, for fear it will not be retained; sharp edges to irritate and loosen the teeth in contact. And with bad articulation they are more an apology for a substitute than a realistic set. They do not relieve the work to be done on the few remaining teeth, but force them out of position and cause weakening of the tissues surrounding.

Look at the mischief that crowning does with a band as an irritant in so many cases, and this extending to others causing secretion to accrue, and finally loss. When properly done and the teeth wedged tightly in, they are a salvation; and how many cases of loose roots can be restored to firmness if well done by crowning, by giving them work to do. See how much mischief is done to the gum-tissue that spreads far and wide from the use of arsenic on the pulps. I will not multiply cases that I know to be factors in this dreaded disease. Have well-adapted instruments and keep them sharp. Use a dull bur in the engine. Do not be afraid of hurting the patient, fearing they may not return. Take the bulk of secretion off at the first sitting, and be sure of it. Cut all loose and excess of gum down to healthy tissue, or rather sound borders, leaving no cause for deposits. It is worse than useless to allow it to bag around the cervix. Make the gums irritable, and they will grow stronger and grasp their fellows with firmness. Use carbolic acid, creosote, or anything that will act as an escharotic, and burn the

dead tissue of the membranes. Have the patient come back in one week, and you can tell if any secretion remains. Remove at once and not disturb the healing tissues. I told you first of all, restore the articulation. Let the parts heal in their own blood, and do not interfere every day with nature.

In other words, imagine you have a fistula to treat. You know the walls will not come together and heal unless they are excoriated and freshened with the scalpel or an escharotic; and so here don't be afraid of tearing the membranes off the tooth or the investment. If I can put the actual cautery there, so much the better. Look on the space between tooth and alveolar border as a narrow fistula. And when clean and well burnt out, it will be sure to heal. If the surface of root at any point is rough, bur it off, and also the dead or lifeless alveolus. I have never cut too much, but frequently too little. The treatment to be given them after leaving you is simple. No washes even. Simple tooth-soap, with the finest pumice in it, is all I use. As small a tooth-brush as is to be had and with not more than three rows of bristles lengthwise, and the whole brush not over one inch long, or an inch and a quarter. One minute brushing immediately after eating. Not more. Never use the brush across, nor up and down, but put it in one place and press down upon the teeth and wriggle it around, keeping it pressed between the teeth.

A small brush requires less pressure to work in between the teeth when the bristles are far apart. Have the patient see you at least every six months, and then do not unnecessarily cut the gums loose, but gently run a scaler around and let them go.

Last, and not least, a tooth-pick. What kind? Never a wooden one of any shape or fibre. They drive the gum up and away from the cervix and keep it forever loose for secretions to embed there. A quill is better than all else, except a very narrow, thin, and long gold one.

In the use of the silk floss charge them not to "see-saw" with it and keep the gums always cut away from the cervix. It does immense mischief to the gums. Pardon me for this lengthy discussion. As I have never said anything before upon it, I say now and for all time, I am satisfied as to the simple treatment of common sense and have no cause to regret the past, and see none why I should change it for all the theories and conjectures of professors or chemists.

*Dr. Broomell.*—I became so interested after listening to the discussion at our last meeting, that I resolved upon making an investigation myself. Since that time I have made it a part of my daily

practice to question those patients in whose mouths I noticed the least inclination to pyorrhœa. The result has been that out of ten patients whom I questioned, all but two reported a rheumatic or gouty diathesis. Two of the cases were especially interesting to me, from the fact that they represented the two extremes in the habits of life and in the manner of living. The first one, a lady, about fifty-five years of age, was a "high liver" in every sense of the term. Entertaining and being entertained, breakfasts, dinners, and teas following each other in rapid succession, partaking most generously of everything that would please the palate and lighten the heart.

This much of her history was given to me without my having to ask for the information. Upon examining her mouth, I discovered aggravated pyorrhœa about several of her teeth. When I inquired into her general health, she informed me that she was a terrible sufferer from rheumatism, gout, and heart-disease. I also learned that her father had suffered in the same manner, and had lost all his teeth prior to his death, no doubt from pyorrhœa, by the description given me by my patient. Upon examining the smaller articulations, there appeared to be no indications of chalky deposits. This patient, I should think, would be a powerful witness as to the correctness of Professor Peirce's theory.

The other case, a Mrs. H., aged fifty-eight, represented a typical subject of the other extreme. Being a strict vegetarian, she declared that neither she nor her parents before her had ever partaken of animal food, shunning all meats, fowls, game, fish, butter, eggs, milk, and spirits. She had been taught, and in turn was teaching her children, to do all that could be done to redeem fallen humanity. For her, olive oil took the place of butter and lard. Her hands could not withstand the irritation produced by wearing kid gloves. The shoes upon her feet were for the greater part constructed from vegetable products, while bone buttons upon the clothing could never be tolerated. To further show me the regard she had for her belief, she has forwarded me a number of bills of fare at the vegetarian restaurant at which she dines when abroad. If, as I understand it, uric acid is produced by animal food, and pyorrhœa is produced by uric acid, this case appears to be somewhat mysterious. Pyorrhœa existed to a considerable extent. The finger-joints were abnormally enlarged, and the complexion, which one would think should be clear and spotless, was wonderfully imperfect.

What, then, can be the conclusion when we find pyorrhœa in two subjects so extremely different.

The President next asked Dr. Brubaker to tell the Society about gout and gouty diathesis in the matter of cases of pyorrhœa.

*Dr. Brubaker.*—Mr. President, it would be impossible in the short time at my disposal to discuss adequately the causation or pathology of gout and its relation to pyorrhœa. As I am, however, to a slight extent, responsible for some of the statements in Dr. Peirce's paper, I will take the opportunity of replying to some of the criticisms which have been made to those statements and which may have a bearing on the pathology of gout and pyorrhœa.

Notwithstanding all the theories which have been propounded from time to time by pathologists as to the cause and pathology of gout, there is yet much difference of opinion; but as to one factor most observers are in accord,—viz., that the underlying cause is the presence in the blood and tissues of uric acid. Inasmuch as phenomena of general gout are so extensive and complex, it has been deemed necessary by some pathologists to invoke the aid of other factors. Dr. Duckworth, for instance, has been at great pains to illustrate the influence of the nervous system in the production of some of the curious phenomena. Nevertheless, this eminent authority states that while "the peculiarly presented relations of uric acid, even in true gout, do not constitute the whole of the disorder," yet, "in spite of teachings to the contrary, I would affirm at the outset that this part of the pathogeny of gout is certain, so that it may be plainly stated, 'no uric acid, no gout.' I would express my adherence to the view that the most unequivocal evidence of true gouty disease is that derived from the presence of uratic salts in the tissues." (A treatise on gout, p. 15.) A statement was made this evening that the uric-acid diathesis and the gouty diathesis are not synonymous terms. This distinction may be made, but in view of the statements of Dr. Duckworth just alluded to, it is hardly tenable. It is true that uric acid may exist in the blood without giving rise to any particular gouty manifestations that can be recognized, but it must be admitted that in the vast majority of instances there is a close relation between that type of disordered nutrition known as the uric-acid diathesis and that type of constitution known as the gouty.

It has also been asserted here that gouty attacks can be produced without uric acid being present, at least in excess. This is exceedingly doubtful. This idea originated with Dr. Todd many years ago, but it has never received much confirmation.

One of the speakers this evening, Dr. Allan, quoting from an article in Pepper's "System of Medicine," vol. ii., said that the distin-

guished writer entertained the idea that uric acid is not the cause of gout. Yet an attentive reading of the article *in extenso* will reveal the fact that the writer regards uric acid as the most constant and important factor in gout production, though he does state that it does not explain all the phenomena. The treatment, both medicinal and dietetic, is based on the view that uric acid is largely the exciting cause. An apparent contradiction to the views of Dr. Peirce that a highly nitrogenized animal diet is a necessary antecedent of the uric-acid diathesis, was offered by Dr. Broomell,—viz., that pyorrhœa is seen in vegetarians and in those who consume but small quantity of meat. This is, indeed, true. But it must be remembered that uric acid may arise from a disintegration of the proteids of the tissues, as well as from an imperfect assimilation of the proteids of the food. And if there is an excess of proteids in the vegetable foods or a defective power of elimination of waste products by the kidneys, it is conceivable that uric acid, one of the products, might be retained in the blood and give rise to the characteristic phenomena.

Again, the chemical analysis of the deposit has been called in question, and it has been asserted that no uric acid, or but little, is present in any given deposit. This is no doubt true in some instances. It must be remembered that in aggravated cases of pyorrhœa there is a continual discharge of pus, and the uric-acid salts are carried away with it. It is not to be expected, therefore, upon the removal of a tooth to find large masses of pure uric acid. The deposit from any tooth is largely composed of an albuminous basis, which, upon the addition of nitric acid, becomes of a bright yellow color. This often obscures to a marked extent the color of the murexide test. The albumen also interferes with the crystalization of the uric acid. Again, care and patience must be exercised in examining the deposit for uric acid. In an analysis made to-day, two hours were occupied with one specimen, from a few grains of which eight crystals of uric acid were obtained. This may not be very striking, but it is sufficient to indicate its character.

Another objection that was made was that pyorrhœa patients are not gouty patients. The value of this statement will depend upon the knowledge and experience which we as individual practitioners have had of determining that fact. How many practitioners here would have been able to diagnose the gouty character of the disordered heart in the first case alluded to by Dr. Peirce? Yet this was done by a most distinguished clinician in this city, and

had the patient followed the course of treatment suggested, it is quite likely he would never have had pyorrhœa.

The view first enunciated by Dr. Peirce as to the pathology of pyorrhœa, as published in the *INTERNATIONAL DENTAL JOURNAL* for January, 1894, may or may not be true; but there is a strong supposition that it is, and the truth of that supposition can be determined by the result of treatment. If these pyorrhœa patients get well on an anti-gout treatment, it is presumptive evidence that they were gouty and the pericementitis but a local manifestation.

*Dr. G. S. Allan.*—I have listened to this paper with exceeding interest. I hoped to get some new points; I haven't got any, except as to treatment, which was general and indicated in Dr. Peirce's former paper. I confess I feel a great deal as if I had been in fairy-land, and that I had listened to some particulars of a disease of which, so far, in my own practice, I had known little or nothing about. The statements in that paper, if uncontradicted, would go to prove that the profession heretofore had practically no knowledge of what pyorrhœa alveolaris was and no knowledge as to its etiology, and that the treatment heretofore on the lines that had been adopted ought to have been, if they have not been, futile and unavailing.

I questioned the accuracy of Dr. Peirce's statements and conclusions. First, on the ground that the presence of uric acid in the system, or uric salts, did not indicate gouty diathesis. I quoted from Pepper's "*System of Medicine*" an article by Dr. Draper on Gout, strongly taking up the position that I had held. I also read a quotation from the *American Journal of Medical Sciences* from a later writer, taking identically the same position. To-day I called upon my old friend, Dr. Thomas Morton, of Philadelphia, and I asked him the same question. He corroborated my position and statements, and when I asked him if I could quote him, he said, "Certainly;" which I now take the liberty of doing.

Taking it for granted there is anything in this theory,—which I doubt,—there are no proofs that the uric-acid and the gouty diathesis can be considered as one and the same, but Dr. Peirce used the two terms almost synonymously. I stated before that you could have gout without uric acid in the system, and you could have uric acid in the system and no gout; and I believe my statements can be well borne out by the evidence of able practitioners.

In a paper I read before the combined societies of New Jersey and Pennsylvania at Asbury Park a few years ago, I made this statement, that if a practitioner had charge of a patient's teeth,



and the patient was conscientious and carried out directions fully and as indicated, it was inexcusable that pyorrhœa alveolaris should have its origin in that mouth, and certainly inexcusable that any destructive work should be done by the disease. That statement I still adhere to; and in that statement I absolutely ignored any such thing as constitutional treatment. In the analyses that I had made of this hæmatogenic calcic deposit, absolutely nothing but a trace, and a trace only, of uric acid was found in that deposit. Now, that is significant. In these analyses that Dr. Peirce has made, the doctor draws attention to the uric acid found in minute quantities only, ignoring the fact that the great bulk of these deposits are calcium phosphate and calcium carbonate. In none of the analyses heretofore made has uric acid ever been recognized, nor was the presence of uric acid in these deposits ever suspected till Dr. Peirce made his report. Now he comes forward and his analyses seem to prove that uric acid is a predominant element. I don't believe that a quantitative analysis made of this hæmatogenic calcic deposit would have shown anything more than a mere trace of uric acid, and this I say because I have the results of the analysis Professor Ricketts made, and from such a large quantity of the material, and failed to find anything but a mere trace.

Another point I made, and that was that after the deposit had been formed no constitutional treatment could take up that deposit, carry it back into the blood-current, and have it eliminated through the ordinary excretory channels. Now, there is no such thing,—there can be no such thing,—from the very nature of the case. Here is a deposit, hard and insoluble, deposited against the root of the tooth. The blood cannot get at it in any way whatever, and I cannot conceive the possibility of any constitutional treatment removing that deposit. The mere statement of the conditions makes the impossibility self-evident. But supposing a good portion of that deposit, as Dr. Peirce indicates, is composed of urates, those urates are still simply mechanical irritants, situated as they are. They are in a place where they act mechanically, and mechanically only; and I maintain that all this train of hæmatogenic calcic pericementitis symptoms comes from the irritating effects of the deposit acting locally."

*Dr. Kirk.*—How came the deposit there?

*Dr. Allan.*—I never denied that a constitutional condition was at the bottom of the deposit. But that is one thing; the disease itself is another. As I stated, the stone in the bladder or in the urinary ducts comes from some constitutional condition; but when

it is in that position, then it starts in business for itself, and all the inflammatory conditions that follow are due to the deposit and not to the constitutional diathesis or condition of the system that produced the deposit. With every desire to do so, I fail to see what point or what bearing this theory will have upon the treatment of pyorrhœa alveolaris, and for these reasons; summing it up, it is just this: Uric acid is not a necessary concomitant of gout or rheumatism; and, granting even that it is, the train of symptoms we have are local manifestations of a local irritant. I do not deny—I never have denied—that there are cases of pyorrhœa alveolaris that, so far as we know, are not caused or produced by a deposit of any kind. I have had such cases in my own practice more than once. I could not account for them, but that does not prove that the great majority of the cases are not produced by this hæmatogenic calcic deposit.

Since I was here last month I made it a habit of asking almost every patient whether they had pyorrhœa or not; have you gout or rheumatism? Tabulated and put into shape for drawing deductions, I find that the results are worse than conclusions. In other words, gouty patients had no pyorrhœa, and patients that had no gout or rheumatism had pyorrhœa, and the significance of the gouty diathesis was simply visionary.

There is a difference between a deposit made in a tissue and one outside of a tissue. The deposit that is on the tooth is outside of the tissue, not inside. It is not, so far as we know, in the peridental membrane. It is a deposit on the exposed surface of the root of the tooth, being deposited on the surface of the root only. Outside of any possible influence the blood may have, I don't see how constitutional treatment can absorb or in any way dispose of that uric-acid deposit.

Where there is death of the periosteum and we have a deposit on the denuded surface of the bone, I do not see how any constitutional treatment would be available for removing the deposit. If Professor Peirce's theory be correct, he has not made it plain, if this deposit takes place in the pericemental membrane, how it is transferred from the pericemental membrane, dead or living, on to the surface of the root of the tooth where we find it.

Dr. McQuillan inquired of Dr. Allan if, in speaking of treating pyorrhœa, he meant that a cure was effected, or whether it is simply the arrest of the disease. Dr. McQuillan acknowledged that he could not cure it.

*Dr. Allan.*—I will answer Dr. McQuillan by referring him to my

paper, in which I said that I could not do it, except in some cases. If the disease is taken in its earlier stages a cure can be effected, but when it has passed beyond what we call the earlier stages, it seems all we can do is to alleviate the consequences; but to make a radical cure in a pronounced case where any quantity of the peridentium has been destroyed, I think most difficult. We can save the tooth for a long time, but that does not cure it. That is arresting it.

*Dr. Truman.*—I desire simply to say that I have cured exactly such cases; cured them perfectly and kept them there.

*Dr. Kirk.*—Allow me to make an explanation. Since the reading of Dr. Peirce's paper at the last meeting, I have been employing all my spare time in making some chemical investigations of these deposits, and the first tests I made were all from cases carefully selected with reference to their possible gouty association.

There is one factor which will necessarily modify the results which one may get from a test of these deposits, and that is the question of quantity. The quantity of material at our disposal in any single case is, necessarily, extremely small. I have examined some seven or eight specimens secured from mouths which had a definite gouty history. The first three of these I put through a series of careful tests and got some slight reaction, but one which I would not like to take into court as definitely showing uric acid. The other cases were those in which I had larger deposits, and were treated not only by the usual test, but they were carefully tested from every stand-point possible, in order to determine whether they did or did not contain uric acid, and I found that they did contain uric acid. In these several specimens there was a marked difference in the character of the deposits.

Some of them were extremely adherent, and were such as Dr. Allan has alluded to as being in close contact with the cementum. I believe they were in close physical union with the cementum of the tooth, with no pericemental membrane intervening. I had two cases, however, in which the deposit was, as nearly as I could determine by the unaided eye, located in the pericemental membrane, because the deposit easily peeled off with a small strip of the membrane adhering to it, showing it was situated in the enveloping membrane of the root. These two cases gave the most marked reaction for uric acid. It was not a haphazard difference, but a very marked one both as to quantity and intensity. It seems to me possible, in fact, highly probable, that deposits in close organic connection with the cementum, and in which the pericemental membrane has been destroyed, are those which mark a later stage

of the disorder. The two cases of which I speak, in which the uric deposit existed only in the pericemental membrane, had not gone on so far, because the deposit of serumal tartar was relatively slight in quantity, with urates in relatively greater proportion.

I want to state also that all the deposits I examined, with the exception of the two in the membrane, consisted essentially of phosphate of lime, and that the uric acid was small in amount. In this relation let me call attention to the analogy which these deposits present to vesical and renal calculi. Cranstoun Charles quotes Thudicum as stating that in nearly all of the vesical and renal calculi examined, of those which contained uric acid, it existed as a nucleus around which the calcium phosphate had been deposited in connection with the organic matrix, and existed in layers concentrically arranged. I believe it is well recognized that all vesical and other calculi must have, or are likely to have, some nucleus around which the deposit takes place, and in many this nucleus was found to have been uric acid. The chemical and physical conditions are such that we might reasonably expect the same chemical and structural features in the deposits of serumal tartar.

Dr. Guilford inquired how the deposition found in the membrane could afterwards be transferred to the cementum.

*Dr. Kirk.*—I do not know that it would, except by production of inflammatory action. A denuded area of cementum would itself be a source of irritation, and the irritation would invite further deposits. I should look upon the deposit in the membrane as precedent to the deposit on the root.

It seems to me that some confusion has arisen in this discussion from the failure to clearly distinguish between the exciting cause of pyorrhœa, which is undoubtedly the deposit, and the predisposing cause which gives rise to the deposit, which Dr. Peirce believes to be the uric-acid diathesis. This seems to me to be correct and logical reasoning, in view of the facts respecting the character of the deposit and the results of specific systemic treatment. Local treatment alone will not cure the disorder; if we hope to prevent recurrence, we must remove the predisposing cause.

*Dr. Bonwill.*—I wish to correct a statement I made in my paper, to the effect that constitutional treatment should never be used. At least one in every two persons has some derangement of the gastric function, which leads to other troubles. Instead of giving remedies, keep the stomach all right by proper food; never drink when eating. That is all the treatment I would give. That is constitutional. Give the food in a proper way.

I would propose as the best way of reaching this thing, that we have clinics, and that Professor Peirce shall bring his subjects and let us see whether or not we understand what pyorrhœa is. I don't believe I do. I want to find out, and that is the way to get at it.

*Dr. Peirce.*—My friend, Dr. Allan, placed words in my mouth on two occasions, words that I do not recollect having uttered in my paper or verbally, and that is that I maintain that I induce the absorption of the deposit or the removal of the deposit by constitutional treatment. In every instance where I have spoken of the treatment of pyorrhœa, I have said emphatically that an instrument for removing the deposit was essential. In every case I make that the starting-point, and follow that up by the application of acid carefully applied; and wherever I have spoken of it, I have made that emphatically the beginning of my treatment, and have only contended that in constitutional treatment I facilitate the process of healing. I have not been successful in curing beyond recurrence, but I have been more successful in the last four months, since I used constitutional treatment, than I ever have been before in cases that I have had in hand four or five years and seeing the patients during that time almost monthly.

Dr. Allan replied that he had probably misunderstood the paper. Adjourned.

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## Editorial.

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### THE RECENT NATIONAL CONVENTIONS.

THE annual conventions having now completed their labors, a brief *résumé* of the work accomplished may be of value in advance of detailed reports.

The Southern Dental Association met August 2, at Old Point Comfort, followed by the National Association of Dental Faculties on August 4, and subsequently by the National Association of Dental Examiners, American Dental Association, and the School of Dental Technics.

It was not the privilege of the writer to attend but one session of the Southern, but that was fully occupied with interesting subjects for thought and discussion and exhibited an earnest effort to

make this annual convocation worthy the best intelligence of the South.

The two important bodies, the National Association of Dental Faculties and the National Association of Dental Examiners, secured more of the interest of educators in attendance, as it was anticipated some important changes would be introduced, especially in the first-named body.

The "Faculties" is always an active centre of thought, for here must be arranged plans for the future development of dental education in this country, and upon its action depends the character of the entire dental educational system of the United States. The responsibility is great, but it has been met with an intelligent appreciation of the needs of the profession.

The impression that seems to prevail in some quarters that this organization has assumed the character of a "trades union society," selfishly working for the interest of the colleges united with it, is a mistaken opinion. It was originally formed to advance dental education, and has at no time swerved from this idea. The great advances made in this direction must be accredited to this body, for every move made in the interest of progress has had its inception in this organization, and was not the result of outside pressure.

The principal object of interest in this meeting, beyond routine business, was the effort made to bring all the schools in harmony as to time. This was accomplished by the adoption of a resolution requiring all colleges belonging to this organization to extend the regular winter session to not less than seven months, to take effect in 1896-97.

Another important rule adopted was that no school can be recognized unless a member in good standing with this body. Heretofore it has been the custom of some schools to give credit for time without regard to membership. This will force all newly organized colleges to take steps to secure admission to the Association. The latter, however, now demands the endorsement of the State Examining Board before it can be placed on the list of applicants.

There was a strong and very proper effort made to advance the preliminary examination so that, in addition to an English education up to the standard required for entrance to the high schools, there should be demanded Latin and physics. The colleges were very nearly equally divided for and against this proposition. The opposition argued that the time had not yet arrived to take this advanced step, and it could not safely be made until the grammar

schools of the country advanced their standard. Until this were done it would necessarily keep out of the profession many worthy young men. It was also contended that the organization should not take a step forward it could not maintain, and this must be the result in the present condition of education in this country. The matter was, on reconsideration, having passed at a previous session, laid on the table. It is recognized that this advance must eventually be made, but it must come in the natural order of development.

A resolution demanding four years for the course of study was introduced and laid over for action next year. It contemplates commencing this advance in 1898-99. It is hoped that the century will close with all these reforms perfected.

The National Association of Dental Examiners is a body somewhat apart and naturally, from the character of its work, more exclusive than the last-named body, but is equally as important in its relations to dental education. For details of its work our readers must scan the published reports.

The "School of Dental Technics," a newly organized body, also held several sessions, to complete the organization commenced last year. This is a child of Western energy. As far as understood by the writer, it aims to improve the methods of teaching operative and mechanical dentistry. It is proposed that each college shall send a delegate to the annual meeting to be held at the same time and place as that decided upon by the National Association of Dental Faculties. The effort is a laudable one, and the indications are that its work will have good results, more especially in recently organized schools where the chairs are filled by inexperienced men.

The American Dental Association convened August 7. About one hundred and fifty members and delegates were present. The story of this meeting had perhaps better be left for the reports. From a scientific view it was the most unsatisfactory meeting the writer has attended in many years, while, on the other hand, it was socially a decided success. There were several excellent papers and reports, but the sections generally seemed to have either hastily prepared their work or neglected it altogether, and as a result the proceedings were hardly above the standard of an interior local society.

The Association was unfortunate in selecting Old Point Comfort as a place of meeting. It proved the reverse of comfortable; in fact, the room in which the meetings were held was so intensely hot that to deliberate in such an atmosphere became a torture, and

the result was a poor attendance and general loss of interest. While the surroundings of Fortress Monroe are full of interest and the panorama of a most varied character, it is not the place for a deliberative body to meet in mid-summer, and should be avoided in the future.

Two important matters were considered at this meeting, and both were left in the hands of committees. The first was a union of the Southern and American Associations. This has been long desired, but up to the present time seemed impossible of attainment. Now it appears not only possible, but certain of being accomplished before the expiration of another year. In view of the certainty of this, the American Association postponed action on the report of the Committee on Revision of the Constitution, so that the Southern members could have an opportunity of expressing their opinions and voting for the laws to govern the united body.

It is to be hoped that when this document is finally placed as the law of the reorganized body, it will have been so framed that members must work to maintain the scientific character of the organization. If this be not done, the days of the American Dental Association are numbered. It is trusted, however, that in the reorganization wise counsels may prevail and that the hallowed memories clustering round this body will not be permitted to die, but that in the infusion of new life it may advance steadily towards scientific methods in its future meetings.

Asbury Park was selected as the place of the meeting in 1895. That the objections to Old Point Comfort will not apply to this place the members may be assured. Everything is there to satisfy the most exacting. Our objection is that it is too far East and that the Association should have selected some place more centrally located.

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## THE PRESENT STATUS OF DENTAL KNOWLEDGE IN THE MEDICAL PROFESSION.

THE teeth, sustaining as they do, intimate anatomical and physiological relations with some of the most important organs of the body, both by continuity of structure and by nervous and vascular communication, not infrequently are found to be the predisposing or exciting cause to some of the most formidable lesions known to pathology. In view of this fact, it is to be regretted that the almost daily practice, of many physicians, reveals a want of ap-



preciation of the important pathological indications so frequently furnished by diseased conditions of these organs.

The two professions, dentistry and medicine, naturally meet and merge at certain points; and as Dr. Kirk has said in an editorial in the *Dental Cosmos*, "the difference in the mental attitude of the physician and dentist towards problems which they meet in common and which cannot be wholly relegated to the sphere of either, is important when regarded from the stand-point of its results." The same writer, some time since, gave a critical review of a work on "The Diseases of the Mouth in Children," by F. Forchheimer, M.D., Professor of Physiology and Clinical Diseases of Children, Medical College of Ohio. This brought out several expressions of opinion from a number of writers in various periodicals, both medical and dental.

Dr. Forchheimer's book, which received favorable notices and commendations by the medical journals, condemns the use of the gum-lancet as a therapeutic measure, on the following grounds:

"1. It is useless: *a*, as far as giving relief to symptoms; *b*, as far as facilitating or hastening teething.

"2. It is useful only as blood-letting, and ought not to be used as such.

"3. It is harmful: *a*, in producing local trouble; *b*, in producing general disturbances, on account of hemorrhage; *c*, in having established a method which is too general to do specific good and too specific for universal use.

"4. It is to be used only as a surgical procedure to give relief to surgical accidents."

This all shows a lamentable, an inexcusable, want of appreciation of the many important pathological indications so frequently accompanying the advancement of the deciduous teeth. The attitude of the medical profession in this matter is further set forth in the following extract from an editorial in the *Journal of the American Medical Association*:

"We think it can be said, without fear of contradiction, that there is not a single positive observation which has ever been recorded to prove that dentition produces general or reflex symptoms. It is undeniable that, at the period in life when dentition is in progress, the infant is subject to certain disorders which occur much more commonly than at any other period of life. If it could be shown that dentition was the only peculiarity of the infant, then its causative influence would be clear. But dentition is not the only peculiarity of the infant, and coexisting phenomena can

only be classed as *coincident*." A remarkable statement coming from one who is supposed to be a teacher, and whose writings are expected to have a certain influence in his profession. It is true that all the diseases of infancy cannot be ascribed to dentition (nor do we attempt to), but there are certain well-marked conditions which are produced by reflex action, and which are unmistakable to the trained intelligence. There is considerable literature upon the subject to which we could refer; the most notable is the very able and exhaustive paper by Professor A. P. Brubaker, in the third volume of the "American System of Dentistry." Attention is called to the following quotation: "It is a reasonable supposition that the laws of nerve-force correspond to the same general laws as other forces. As no force is ever lost, but must, when it disappears, appear as some other mode of motion, so peripheral irritation—continually travelling inward—is either reflected over and outward by other routes to other organs, or is stored up in interrelated centres until morbid function results in them."

We have not the space to quote fully from authorities, but the following from the pen of Professor Truman—in writing editorially in this journal—seems to apply admirably to the point of "coincident:" "It is certainly too late in the progress of medical science," he says, "to assert that no reflex disturbance occurs in teething, or that it is solely dependent upon the eruption through the gum-tissue. Such a statement seems to indicate a blind perversion of facts, and which could never be made truthfully by one who had watched the progressive phenomena resulting from dentition and the relief afforded by the use of the lance."

As further evidence of the need of a higher standard of dental knowledge for medical practitioners, especially those who incidentally figure as teachers, we cite the following: A well-known surgeon, who is also an author and a professor, cautions his students to "be sure, before extracting a tooth, to cut the *ligamentum dentis*." He then relates that its discoverer "first detected it *by means of a microscope*, in the maxilla of a hog, and afterwards demonstrated it in the human subject." Another interesting instance is given by a contributor to one of our journals. He was requested by a practising physician, who was also an editor of a medical journal, to see a child who was "suffering from some trouble which was difficult to diagnose,—a most extraordinary and distressing case. A portion of the superior maxillary bone was denuded; integument sloughing away, etc." Upon examination, there was found protruding some distance above the gum margin the denuded root of

a decayed temporary tooth, such as we frequently see; this being the sole cause for the alarm. We frequently learn of physicians allowing patients to suffer from alveolar abscess, putting them to bed with the information that they are suffering from "neuralgia." And quite recently a lady called upon us with the request to have a small amalgam filling removed. It was the only alloy filling she had and was in good condition. She had been sent by her physician, who claimed he could not cure a throat affection, from which she was suffering, as long as the filling was retained.

Our literature is replete with authentic reports of such cases, but an excellent illustration of the point in hand, one that has never been published, we take from the practice of Professor Peirce. A well-known neurologist had under his care a lad suffering from chorea. The case was presented to Dr. Peirce, who, on examination, found several persistent deciduous teeth interfering with the normal eruption of the bicuspid, and these at his suggestion were removed, and within a few days the distressing symptoms disappeared. Under the care of the same was a girl subject to attacks of epilepsy, which were thought by the attending physician to be incurable, but upon the removal of several deciduous teeth and two diseased first molars, the marked improvement was evidence conclusive that dental irritation was in this case also an important factor.

A well-known dental writer, the late Professor Richardson, has truly said that it is the reproach of *curative* medical science that patients are daily drugged for the relief of maladies which, being purely symptomatic of, or dependent on, dental diseases or irritation, are diagnosed and obstinately and perseveringly treated as idiopathic affections.

It is also a reproach of *conservative* medical science that countless numbers of teeth are, year after year, uselessly and mercilessly sacrificed through the direct agency, or complicity, of many medical practitioners; and a reproach of *sanitary* medical science that, while the greatest circumspection is displayed in guarding the many approaches to the citadel of health, one of the most exposed and vulnerable points, whose defence is essential to the general safety, should be left so entirely uncared for.

Of course, all medical practitioners are not thus perverse and stupid. We number among our clients several of our most active physicians, who are always anxious, through personal and professional intercourse, to secure any information of value. Many of us, too, are called in consultation by physicians who recognize the close relationship of dentistry and medicine. But these are the

exceptions—they are the salt of the profession. It is the average medical practitioner (which is the majority) to whom we allude.

There are obvious reasons, too, why the general practitioner can not be said to be entirely at fault where the teeth are concerned. His partial vindication is in the fact that the present instrumentalities employed as means of imparting a medical education afford little or no opportunity for the acquirement of the truths so amply revealed by observation and experience to our own profession.

It is therefore desirable—and it would be a wise step in the higher education of medical students—that a chair of dental pathology be established in our medical schools, and that both student and practitioner should keep in touch with our best current literature.

G. W. W.

## NO SEX IN SCIENCE.

At the recent meeting of the American Dental Association, Mrs. Emma E. Chase, of St. Louis, Mo., was elected Corresponding Secretary by the unanimous vote of the members.

This is worthy of note, as showing the advance in thought in this direction since the writer introduced a resolution in this body in 1869, advocating the admission of women to the work of the profession. Now they are not only admitted upon an equality in practice, but a woman secures a responsible position in the National Association without an effort and with the applause of those present.

Mrs. Chase is a daughter of the late Professor Eames, of St. Louis.

## Bibliography.

AN ILLUSTRATED DICTIONARY OF MEDICINE, BIOLOGY, AND ALLIED SCIENCES. By George M. Gould, A.M., M.D., author of "The Student's Medical Dictionary;" editor of the *Medical News*, etc. P. Blackiston, Son & Co., Philadelphia. \$10; with index, \$12.

Dr. Gould has already become well known as the author of dictionaries, but in this great work he has excelled all previous efforts.

Many hundreds of new words have been introduced into medical and dental literature during the past few years, marked as they have been by great scientific activity and progress; and this is largely a fresh gathering from the living literature of the day, and not a mere compilation and copying from the many books already published. It is a stupendous work, in which the author has received valuable assistance from such scholars as Drs. C. W. Green, W. A. N. Dorland, A. A. Eshner, A. C. Wood, S. McClintock Hamill, Emma Billstein, J. C. Da Costa, Professors B. G. Wilder, Charles S. Dolley, S. H. Gage, Henry Leffmann, Albert P. Brubaker, and others, and they have all brought to it the ripest fruits of their knowledge.

This work includes all the more commonly used terms of biology,—a thing highly desirable (1)—as the author states in his preface—because of the modern recognition of the great truth that general biologic science is the foundation of genuine and progressive medical science; (2) because the best schools of medicine are more and more urging or making obligatory the preliminary biologic course of study, and (3) because no satisfactory lexicon of biology exists in English.

In the spelling of certain chemic words the author has followed the advice of the American Association for the Advancement of Science, and has indicated the best pronunciation of words by the simplest and most easily understood phonetic method.

A unique and important feature is the incorporation of a large number of tables, wherein numerous facts are brought together and classified. Among these we may point out tables of acids, arteries, bacteria, electric batteries, foods, hydrocarbons, nerves, operations, paralysis, parasites, points, postures, and tumors. This seems deserving of mention, as there is not to be found in medical literature so complete and digested a *résumé* of surgical operations, of bacteriology, parasitology, tests, tumors, etc., as is here furnished.

A somewhat careful examination of the work has failed to show but a few words upon dental subjects that have been omitted or but what have received just treatment. The labor, patience, and fidelity shown, not only in the author's work but by the publishers and printers, must excite the admiration of every one competent to form, and willing to give, an intelligent opinion. Bearing as it does the stamp of extreme carefulness and accuracy, it will no doubt early take the place of leader among medical dictionaries.

G. W. W.

## Obituary.

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### RICHARD BAYLY WINDER, M.D., D.D.S.

DIED at Baltimore, Md., July 18, 1894, Professor R. B. Winder, Dean of the Baltimore College of Dental Surgery.

He was born July 17, 1828, at Accomac Court-House, then called Drummondtown, on the Eastern Shore of Virginia. He was the eldest born of Nathaniel James Winder and wife, Sarah Upshur Bayly. The family were in direct descent from Sir George Yardley, one of the early governors of Virginia.

Dr. Winder was educated at Princeton and the Virginia University. He married, at an early age, into the Curtis family and settled in Accomac County on one of the old homesteads, called "The Folly," where he resided until 1861. When the war broke out between the North and the South, he was among the first to tender his service and that of his company to the Confederate States. At the close of the war, like the majority of those connected with the "Lost Cause," he returned to his home without sufficient means to live as he had been accustomed to, in luxurious ease and elegance. With characteristic energy he set to work to build for the future, instead of vainly repining at his serious losses and much suffering. It was said of him by the late Governor Henry A. Wise, who had known him from boyhood, that "Dick Winder had lost and suffered more than any man he knew, and with less complaint."

Dr. Winder was married in April, 1869, to Miss Kate Dorsey, of Frederick County, Md. The same year, he graduated in dentistry at the Baltimore College of Dental Surgery. His interest in dental education was a prominent feature of his active life. He organized, in company with others, the Maryland Dental College. This was merged into the Baltimore College of Dental Surgery, of which he eventually became the Dean. His interest thereafter was largely bound up in college work. Professor Winder's ability as an educator was recognized throughout the dental profession, and largely through his influence the Baltimore College prospered as never before. His work was thorough, and his kindness to the young men under his charge was marked in character as it was decided in its influence for good. He was the originator of the idea of a national organiza-

tion of dental colleges of the United States, and this bore fruit in the formation of the National Association of Dental Faculties, the most powerful organization probably ever established. Through its influence the entire course of dental education has been changed and the standard advanced beyond the anticipations of the most sanguine.

The intimate relations of the writer with Dr. Winder long since led to the conclusion that his genial character, scholarly ability, and progressive tendencies were not as well understood as they should have been. He was earnest in his convictions and faithful to his friends, and in his death the profession has to mourn one who faithfully worked for its best interests to his last hour.

The funeral took place from his residence, 716 Park Avenue, Baltimore, July 21, 1894.

J. T.

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#### RESOLUTIONS OF RESPECT TO DR. WINDER.

At the regular meeting of the New Jersey State Dental Association, held at Asbury Park, July 19, 1894, the following resolutions were passed:

**WHEREAS**, In the death of our esteemed honorary member, Richard B. Winder, M.D., D.D.S., Dean of the Baltimore College of Dental Surgery, the dental profession and this Association have lost one of its worthy and honored members. He was foremost with those who labored to advance the dental profession by filling its ranks with honorable dentists. He was a devoted professional brother, kind and charitable to an eminent degree, and filled with true Southern hospitality wherever met. Therefore be it

*Resolved*, That we bow to the inevitable, yet desire to emphasize our grief at his death, and to bear testimony to his many abilities and self-sacrificing spirit in his intercourse with his fellow-men.

*Resolved*, That a copy of these resolutions be spread on the minutes and the same be sent to the dental journals for publication.

F. C. BARLOW.

S. C. G. WATKINS.

R. M. SANGER.

## Domestic Correspondence.

### ORISTRY: ANOTHER NAME.

TO THE EDITOR:

SIR,—I think the *INTERNATIONAL DENTAL JOURNAL* is the first journal to recognize the fact, as stated in its editorial on page 476 of the July number, that "the term dentistry has ceased to represent modern thought and practice, and must therefore give way to a newer word."

This matter of nomenclature for the advanced practice was discussed in 1880, by a small professional club, and both the Greek word, *stomatology*, and the Latin word, *oristry*, were suggested.

The word *oristry* is formed from the Latin *os*, *oris*, in the same way that the word *dentistry* is formed from *dens*, *dentis*; but the latter means only the teeth, while *oris* comprehends the mouth, including the teeth, of course. And it is the care of the health of the mouth that now constitutes the best practice with the large body of educated men in the profession.

Preferring the word *oristry* as being the more pleasant in sound, and easier for the laity to understand, I have adopted it since 1880.

I will add an extract from my address to our section in the American Medical Association, at Nashville, Tenn., in May, 1890. I said, "In earlier years there were only a few qualified practitioners who devoted their knowledge and skill to the treatment of the whole oral cavity, while the larger number gave their attention simply to the teeth, and so the specialty was called dentistry. But at this day, when knowledge of the principles of medicine and surgery is more general, and more commonly made available in the treatment of the whole oral cavity and with reference to its influence on the health of the system, the old term seems too limited. And what now would be a more proper and comprehensive name for the specialty, so practised, than the word *oristry*?"

JACOB L. WILLIAMS.

Boston, July 10, 1894.



## Notes and Comments.<sup>1</sup>

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**DEVELOPMENT OF CHARACTER.**—Can one overcome temperament? is a question often forced upon the thoughtful mind. If the question is asked with enough earnestness to lead one to try the experiment on himself, he will thereafter have more to say about self-training than home training. It is admitted that inherited traits can be modified, if not overcome. Temper, disagreeable voice or gesture, an ungraceful walk, a tendency to untruthfulness—all traits that weaken or mar character—are being constantly effaced by those who recognize inherited burdens. If this were not so, we would ask, with a recent writer in the *Outlook*, what would we mean by development of character?

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**A WORD CONCERNING DISCUSSION AND CRITICISM.**—The definition of the verb to discuss is to shake apart, so as to examine thoroughly; in fact, it is taken from a Latin word which means to shake. When a body of men and women are brought together for mutual benefit, as is the object of our society meetings, it would be well if the literal meaning of the word were always the real significance given it in practice. Unfortunately in some of our meetings many of the speakers seem to have no such object in view. At times the proceedings read as though the sole purpose of the society was to further the art of mutual admiration; then, again, one would think it was the report of a verbal pugilistic performance. Happily, however, a higher appreciation of society meetings is being developed, and it is desirable as far as possible that personalities should be eliminated; but when one feels justified in terming an essay "elementary" (see page 580), it should be known that it is the essay, not the essayist, that is referred to. And, further, it is well to remember the words of Lowell, where he says, "When Mr. Mathew Arnold charges Shakespeare with exaggeration, it shall not set me in a passion, but put me upon honest inquiry, rather, to find out whether the fault is in the poet or the critic."

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<sup>1</sup> The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 212 South Fifteenth Street, Philadelphia.

**THE ASSIMILATION OF MINERALS.**—A recent writer in the *Items of Interest* has truly said that we have little power to assimilate minerals taken as mere separate chemicals. It is principally by their being assimilated first into vegetable life that they are capable of becoming an integral part of our animal economy; they are made still more easily digested by us if they come from the vegetable through the higher organization of the lower animals. The flinty rock becomes the silica of the teeth by becoming first the silica of the wheat. Iron is hard to chew, and almost as hard to digest as a powder, but presented as beefsteak it easily enters every tissue of the body.

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## Current News.

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### MISSOURI STATE DENTAL ASSOCIATION.

**THE** Thirtieth Annual Meeting of the Missouri State Dental Association was held at Excelsior Springs, July 10 to 13, 1894. The following officers for the ensuing year were elected:

Dr. J. T. Fry, Moberly, President; Dr. D. F. Orr, Liberty, First Vice-President; Dr. W. L. Reed, Mexico, Second Vice-President; Dr. W. M. Carter, Sedalia, Corresponding Secretary; Dr. S. C. A. Ruby, Clinton, Recording Secretary; Dr. James A. Price, Savannah, Treasurer; Dr. James A. Price, Savannah, Committee on Law.

The next meeting will be held at Pertle Springs, beginning on the first Tuesday after the Fourth of July, 1895, and continuing in session four days.

W. M. CARTER,  
*Corresponding Secretary.*

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### FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

**THE** First District Dental Society of Illinois will hold its Annual Meeting September 11 and 12.

A thoroughly practical programme has been prepared,—“Papers” and “Clinics,”—and the meeting will prove interesting and instructive.

O. M. DAYMUDE, Monmouth, Ill.,  
*President.*

W. O. BUTLER, La Harpe, Ill.,  
*Secretary.*

# THE International Dental Journal.

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## Original Communications.<sup>1</sup>

### AN ARTIFICIAL NOSE.<sup>2</sup>

BY P. W. MORLARTY, D.M.D., BOSTON, MASS.

ON January 10, 1894, J. W. T., aged twenty-three, the patient, whom I present this evening, came to the infirmary of the Harvard Dental School to have an obturator made to relieve a deformity due to disease which first made its appearance eight years ago.

A plate made with several teeth attached restored the voice and covered the perforation in the hard palate.

By glancing at the young man's face you can see the distressing deformity due to this disease (Fig. 1).

To hide this I urged upon him the advisability of having an artificial nose made.

You are familiar with the efforts of Drs. Brackett, Kingsley, and others in this direction.

An impression of the deformed nose and adjacent parts was taken in plaster and a cast made.

A wax nose was made for a model, and by additions and carvings and frequent trials upon the patient it was brought to the shape desired.

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<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

<sup>2</sup> Exhibited before the Harvard Odontological Society April 26, 1894.

A metal die and counter-die of the prepared wax nose was made, and a thin platinum shell struck up. Nostrils were soldered to it. This was covered with continuous gum body and baked.

The flesh-colored enamel was then added and the piece again baked.

Hydrofluoric acid was used to soften the color and remove the glaze.

Owing to the small size of the nasal orifices it was impossible to attach the nose to the obturator, or by springs inserted through the nostrils.

A rim of German silver was made shaped to the upper edge of the artificial nose, and extending about three-quarters of an inch downward on each side. To this a pair of spectacles was soldered, and the rim fastened with small rivets to the platinum shell, the spectacles with an elastic band passing around the head and holding the nose in position (Fig. 2).

Mr. A. G. Smith, one of our students, had charge of the case. That you may judge as to the success of the appliance, the patient has kindly consented to appear before you this evening.

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## REVIEW AND REVISION OF PRACTICE.<sup>1</sup>

BY S. B. PALMER, M.D.S., SYRACUSE, N. Y.

MR. PRESIDENT AND MEMBERS OF THE NEW YORK ODONTOLOGICAL SOCIETY,—I am very thankful for the opportunity afforded me to read a paper on this occasion. Having been requested by your president, secretary, and my friend Dr. Lord, I have reason to believe you desired something, and my acceptance is evidence that I have something I wish to say, because it belongs to you more than to any other organization. It was before this Society nearly nineteen years ago that I read a paper entitled "Chemistry of Dental Caries;" we would now say "Etiology." The doctrines were scientific and in advance of practice; consequently they met opposition by some, and were not understood by others.

In consequence of these heretical principles being incorporated in the "basal principles" of the New Departure, the Odontological Society, two years later, became the battle-field of science. I am

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<sup>1</sup> Read before the New York Odontological Society, June 19, 1894.

**FIG. 1.**



**FIG. 2.**





glad to be counted worthy of membership in an organization which is foremost to invite discussion upon any subject, however radical, allowing it to stand or fall upon its merits. I am particularly happy to-night that there is now no opposition to what will be offered, because it has become the foundation of practice; and not less happy that I come to review portions of the paper of the long ago. Gentlemen, I am stimulated to work, that operative dentistry may be placed upon a scientific basis. Both medical and dental progress is founded upon empirical practice. The aim of this effort is to prove that *oxygen* is the primary cause of caries. Oxygen is a gas, the most abundant of the elements. It forms about one-fifth part of the atmosphere, of which it is the active element.

It is also found as an important element of animal and vegetable tissues, and it ranks as the most *electro-negative* of all elements. This is the central thought of the whole subject: oxygen is the "most electro-negative of all elements." Let us comprehend this meaning. In a galvanic battery the negative element is of copper, platinum, carbon, etc., elements which are not acted upon by the liquid in the cell, but without such an element the latter would not be complete. It is from the negative element that the positive current goes out to do its work. If it enters the same cell the current decomposes the water in connection with the zinc, or positive element; the oxygen thus liberated dissolves or oxidizes the zinc. When all the zinc is oxidized the action ceases, or when copper is used for the negative element in a solution of sulphate of copper, and the copper is allowed to form on the surface of the zinc, the current ceases, because the zinc is protected by copper, and there is no difference in potential between two plates of copper.

By potential we mean the difference between the two poles of a battery. In all batteries with an open circuit the positive pole is of a higher potential than the negative. Connect the circuit, a current flows which runs the potential down, and a constant current will flow according to the construction of the battery. There are three points to be carried forward: 1, oxygen is an element; 2, oxygen is an effect of galvanic decomposition; 3, oxidation of a positive plate equalizes potential. Those are the *combinations*, and *potential* is the *key* which will unlock and reveal etiology of dental caries. While this may appear scientific, *practical* is written between the lines. It has been so written with a view to teach how we do, and why we do. A colored man gave his opinion of forecasting events thus: "You can't fo'know till afterwards." This is not true

of scientific teachings. I hope to present the laws which govern matter so plainly as to show that practice is now conducted accordingly; that no one can fail to believe them true; also to quote from the paper to show that the same laws were given, and were recorded, in the transactions of this Society nineteen years ago.

We get along very well with teaching inorganic electro-chemistry, but falter when organic chemistry is reached. A few explanations may help the understanding up and into organic chemistry, which is the plane of our operations. In the mineral realm we have elements of minerals that we can see, feel, and weigh. All those elements must undergo change and be converted into vegetable and animal compounds; that is, the atoms must be separated and combined with other elements to build up and support organic bodies and life. Not an atom of an element is destroyed, nor do they lose their individuality; and when their combination allows mobility of molecules, each atom holds potential relations with atoms of other elements. By such relations chemical affinity, cohesion, etc., are effects. Composition implies also decomposition, because the breaking up of a compound to satisfy stronger affinities disengages other elements to form relations most compatible to their potential.

According to Faraday, one hundred parts of steel alloyed with one of platinum is dissolved with effervescence in dilute sulphuric acid, too weak to act with perceptible energy on common steel, the steel being rendered positive by the atoms of platinum distributed throughout the mass. On the other hand, a like quantity of zinc distributed over the surface of steel would render it negative to common steel. We are able to follow this law into organic compounds where atoms or molecules are at liberty to unite or disband according to conditions presided over by natural laws.

To make a practical application of the foregoing, let us divide the subject and discuss it under three heads.

1. Etiology of caries.

2. Remedies upon the principles set forth in the paper under review.

3. Etiology of caries with corresponding remedies according to modern research and accepted conclusions.

After what has been said in the introduction, we need only to recapitulate the main points contained in the first division. Caries is the effect of potential relation between elements contained in the tooth-structure and those to which teeth are exposed,—namely, saliva, food, acids, alkalies, etc., also galvanic currents generated



from metals worn in the mouth, as fillings, crowns, bridges, and plates, and, more than all else, oxygen, which is furnished in the air we breathe, which comes in contact with the contents of the mouth, including the dental organs. We are to regard this as much an electro-negative element to anything in the mouth, except gold and platinum, as though it were a visible mineral. The name oxygen, from two Greek words, meaning a generator of acids, was given it by Lavoisier in 1778. It is an element in nearly all acids. Water is an example of a neutral compound. The connection between oxygen, acids, and electricity is most wonderful. Like heat, light, electricity, and magnetism, they are interchangeable.

Connect the poles of a battery, oxygen dissolves or oxidizes zinc, a current flows which is electricity. Dip the electrodes into another cell, oxygen is generated, acid is also a result. Pierce the cover of a fruit-jar, oxygen enters, fermentation takes place. During electric storms milk sours. Oxygen finds our rubber dam and it becomes tender. Neglect our steel instruments and they corrode. Wood exposed to moisture decays. Devitalized animal substance putrefies. Here let us draw a line at the gingival border and give a condition of alkaline reaction instead of acid, water being neutral.

All cavities, pockets, or receptacles for the retention of particles of food on the crown side of this line give acid reaction from fermentation, while cavities beneath the gums, in roots or in pockets, as in pyorrhœa, are opposite or alkaline: thus one is decay and the other putrefaction. In corroboration, alkaline powders and washes are used upon the crowns and necks, acids in roots and pockets beneath the gums. In selecting material for filling, the first question should be, What are the conditions, normal or abnormal? By normal we mean teeth fully developed and fairly well calcified. Any material will preserve this class of teeth so long as it excludes circulation of moisture between the plug and the walls of cavity, because electrolysis occurs only when there can be an interchange of molecules; such teeth are not electrolytes, consequently are not injured by gold fillings.

By abnormal dentine we mean frail structure, more especially young teeth, which are electrolytes in proportion to their conductivity. This condition admits of the following changes: The dentine contains undue proportions of organic matter, the surface in contact with a gold filling is devitalized by thermal changes, and, not being protected as normal dentine is by inorganic matter, the animal portion decays, the cavity is enlarged, etc.

Here we must call to mind a statement already made that oxygen is connected with galvanic current; also state still another fact that any matter while in the mouth, temporary or permanent, becomes charged with potential higher than tooth-tissue, pulps, etc. If the dentine is normal, no harm is done, no current is established, except as the tongue or mucous membrane comes in contact to equalize potential. But in cases where the dentine is a conductor, as the pulp or dental fibrilla testifies, the capillary currents, which go to carry material for calcifying the dentine, are turned back and the dentine does not become dense, as it often does with adult teeth which occlude in a manner to be greatly worn down. In the latter case sensitiveness becomes a stimulant, and the bone-builders continue to work and often barricade against the enemy. Here is a solution of the whole matter. Nature works from *within* upon or from the alkaline pole. Oxygen with its attendant acid works externally, growth and decay is the effect of a balance between the two forces, and excessive introduction of oxygen or acid reverses the current with results disastrous to vitality.

Thus the natural inner current is reversed by the oxygen current from without.

We are presenting facts which come under the conditions mentioned, potential relations of matter which have nothing to do with organic acids or fermentation, but acid as a result of oxygen in connection with galvanic currents.

Now please consider the treatment. There are those who oppose vaccination. So there are those who still oppose the principle here taught and yet make use of the remedies empirically. I am here to submit the following to a committee of the whole, members of the Odontological Society. I will repeat, caries is the result of the difference of the potential. Oxygen is the active agent. Its mission is to oxidize every other element, and it has succeeded with few exceptions. Nearly every compound bears the stamp *oxide*, which is readily honored, and the compound is not disturbed, as small-pox usually honors a valid scar. Living organic bodies contain more or less oxygen; in fact, it is an important element of animal and vegetable tissues, and while life remains there is a balance of power within. When life is extinct, the remains become inorganic matter and oxygen sets up cremation. This is the condition of devitalized dentine of low-grade dentistry. So to speak, the remedy is to vaccinate the dentine with an oxide.

Now let us see how this agrees with knowledge gained by empirical practice. Tin preserves teeth better than gold, first,

because its potential is much nearer dentine than gold, as well as being much less a conductor. Second, the moisture in the dentine produces stanic oxide, which is insoluble, and thus oxidation ceases. When one or two layers of tin-foil are placed as a lining under gold the same action takes place, with this addition, by the moisture atoms of gold and tin combine to make an alloy of tin and gold which is indestructible and preserving. Allow me to run into practice enough to complete this combination, or you may get more information by experience than would be agreeable. A combination of gold and tin may be made where one-half of the filling or more is tin with no separation at the line of junction nor dissolution of the tin by electrolytic action. But when tin is used in small quantities as a guard filling under gold this will occur: one thickness of heavy tin or more of light foil will be preserved by mutual induction from the gold, which is the limit of such action. The balance of tin, say, of a thickness of two or more layers, becomes oxidized by the galvanic current. The oxide is unlike that around a tin filling,—it is black and soft and may be washed away. Decay does not occur so long as the oxide remains. But in case of a body of tin one-third or more of the filling no such oxidation takes place. Amalgam fillings furnish an oxide or sulphide which enters the tubuli, and thus the potentials are equal,—no acid, no decay.

It seems out of place for me to offer my views on amalgam in this Society, where so much work has been done by those possessing better opportunities and advantages than I could command. Still, the line of work of which I will speak does not conflict with any that has been done. The shrinkage of amalgam is a serious objection to its usefulness. Nor can that be relied upon which meets every requirement in the tube-tests or index micrometers. I can barely state facts in connection with the practical shrinkage of amalgams, as time forbids illustration. All amalgam fillings composed of particles of an alloy, either in filings or shavings, and mercury, after they have completely set, are composed of two elements of different potentials. The negative consists of the coarser or unamalgamated alloys, which include that partially amalgamated, the positive elements being the larger portion, which is fully amalgamated. The latter contains more mercury than the former. To prove this, take an amalgam filling which has been worn, file to a flat surface, and polish a section; a glass shows no difference in structure; put the filling in circuit with a galvanometer with short needles, wet the surface with dilute acid, and

with a needle-point of platinum slowly trace the surface. The current will be severed as the point passes from one element to the other so rapidly as to seem crazy. If this surface or plug is wrapped in a covering wet with acid, the surface becomes rough and uneven. This is what occurs with amalgam when introduced into a cavity.

To convince you that this is no new discovery with the writer, we quote the following from a paper read before the Dental Society of the State of New York, 1874,—twenty years ago.

"Unfortunately a porous tooth containing an amalgam plug has in it the elements of a minute yet intense battery, capable of decomposing not only the plug but the tooth around it.

"Galvanic action takes place on all surfaces of the mass, and 'within as far as moisture extends. We look in vain for amalgam plugs to be bright on the surfaces in contact with dentine.

"Hasty mixing of the coarse material in the hand will surely result in decomposition of the plug and enlargement of the cavity. By rendering the compound to a fine paste and forcing out all free mercury, galvanic action may be greatly reduced."

After twenty years of observation of the above statements I will add the following, which may be as beneficial to others as it is to me. The amalgam filling does its best in teeth of normal structure. The slight oxidation furnishes oxide to satisfy the oxygen which otherwise would attack the dentine; thus the plug unites with the dentine; occasionally the oxide extends into its surface. Then it is potentials are equal, and no more oxygen and no complaint of the shrinkage of the plug. Place the same material in porous dentine: unless there is copper in the alloy the moisture acts upon the mercury by reason of the negative elements in the plug; the oxide formed will not fill the tubuli; consequently the plug shrinks by surface decomposition; at the same time the oxygen acts upon the organic element of the dentine. To obviate this, for the last year I have lined cavities with tin-foil, much or little, so that it does not come to the surface. Place one or two layers of tin-foil over the cavity and adapt it with a ball burnisher; no matter if it overlaps, it brushes away at the touch of the filling. By so doing an amalgam of tin is presented to the dentine while the tin blends the two elements in the amalgam proper. This promises well. Of course, the time is too short to judge for durability, and we can see no cause for failure. Such fillings do not discolor dentine, nor do I use any copper in the amalgam. This lesson came from the battery where zinc is amalgamated

to correct local action on the plates caused by impurities, like iron in the zinc. And it is effectual. The tin-foil is used for the same purpose. Another phase of amalgam is noticed where amalgam plugs have been made on the instalment plan. It is of frequent occurrence that a line of separation appears between the pieces of the filling. The occasion is this; When new amalgam is added to the old the union is perfect, provided the surface is bright, because mercury amalgamates with the old portion, none of the new alloy fillings interlock with the old; consequently there is a line, however thin, that contains only that which is perfectly amalgamated. Thus the surface of the original contains more mercury than the rest of the plug and the joint less of the alloy, which renders the soldering, so to speak, positive between the negative elements. To remedy this, amalgamate the surface and lay upon it a thickness of gold-foil. The joint will be negative to the material on either side and the last portion to be dissolved.

I am treating of the potential relations of matter which does not allow mention of cavity lining with varnish of oxyphosphates, etc.

So far we have discussed caries upon the first principles manifested in chemical change, as given twenty years ago. After all that has been done within the last decade to solve the mystery of dental caries, it would be injustice to scientific investigators, as well as to my hearers, not to mention the conclusions reached, as well as some of the advantages gained to the profession. We can get correct views of what is claimed by quoting from an article given to the profession in relation to modern achievements.

"Dental caries is primarily produced by an acid which is the product of a ferment organism. Fermentation in the mouth does not essentially differ from that out of it. But one of the products of that process is this acid. . . . demonstrated to be identical with lactic acid. This being produced in immediate contact with tooth-tissue, dissolves the calcareous portion, thus forming a pocket, in which fermentation proceeds with increased vigor. The inorganic elements being first dissolved out, the organic portions are destroyed by yet other organisms, and thus decay proceeds." The above is merely a hint to what has been accomplished and scientifically demonstrated, and the writer has nothing but commendation for the painstaking work which has been done for the profession to get at the foundation cause of caries, and also for the new remedies recommended to meet the conditions discovered. All is right provided fermentation is *the* cause and antiseptics the remedy.

The claim as read covers all, and the fact that nothing is said about the principles, as given in this paper, is conclusive that oxygen as an electro-negative element is not counted worthy of notice. This, however, does not interest the profession, but the practical conclusions are of importance.

In one case caries is the effect of a positive element being burned up by oxygen, and the remedy consists in raising the potential of that element equal to oxygen, when decay ceases. The other is, caries is caused by fermentation, as, indeed, it is under the conditions mentioned, and the remedies consist of antiseptics which in time are subdued by the destroyer oxygen. After mentioning the various opinions and contentions which were connected with this subject the article says, "There is nothing of this now. The deep mystery in dentistry is made plain, and there is not one of the former warring elements in sight."

Which is true so far as the writer is concerned. There are no two theories under discussion, but two conditions of caries. It was my intention to represent both, but since investigation has been turned towards micro-organisms I accept the conclusions as so much help. I think we now have two halves which make a whole. And here the matter rests. It is for you to decide whether there be any science connected with adapting fillings to the conditions of the teeth upon potential principles.

When at your meeting in February last I had occasion to mention root-filling, or more especially drying canals by points heated by electricity, further experimenting in root-filling has led me to discard some remedies,—oils which are highly recommended as antiseptics,—not because they fail in this particular, but for lack of permanency. What I now say of canals I mean the apex and fine capillary canals which cannot be dried. Capillary attraction works as well to draw liquid from the tissue at the open end of the root as it does when the canal is dry to draw the antiseptic in from the pulp cavity.

Oxygen respects carbon. Railroad managers have commenced steeping ties in creosote. So long as that lasts decay will not trouble. But for the color, coal-tar would make an excellent root-filling. As an experiment I have two abscessed roots under treatment filled at once with pulverized charcoal, moistened with water only. Still, charcoal is not an antiseptic, and yet it may render the roots sterile to organisms. If so, it will be permanent, though not recommended for practice.

Direct thought to the most permanent root-fillings. Gutta-

percha contains oxide. Oxychloride leaves an oxide after the anti-septic properties have vanished. We venture the prediction that the coming root-filling—at the apex I mean—will be an oxide-chloride or their equivalent in carbon, and that they will be introduced with alcohol or water. Experiments prove that it is almost impossible to remove any oil or fixed substance from the capillary canal. Dry them as you will, capillary attraction will fill the apex with liquid from the opening. If oil is forced through or in to fill the small points, it will remain until oxidized and the place filled with septic matter. To give a better idea of my meaning I will say that nitrate of silver would meet the requirements so far as potential is concerned, but would not be advisable on account of color.

It is only at the apex where the trouble lies. Let the experiment be made with metallic oxide in some liquid which will unite with the water which cannot be dried out of the canal. I suggest gold or platinum points for experimenting; let them be long enough to reach the pulp cavity and bent so as to assist in removal, but left in if all should be right. Cleanse the canal by using alcohol, but do not attempt to dry the apex; work in the oxide with fine broaches; draw out all the fluid that will be taken up by paper points or absorbents, and insert the point; fill pulp-chamber with any material indicated. The reason for suggesting gold or a negative element is this: the root is opposite in potential to the crown, or one is alkaline and the other acid. Still the reaction from oxygen in roots is alkaline, whereas in crown cavities it is acid.

A gold point in itself would not change any more than a gold filling changes. It is the effect which we wish to avoid in crowns that is indicated desirable in roots. Since there is no acid reaction in roots, an ill-fitting gold point would not injure the dentine, as a loose plug does in a tooth. One thing is certain, if we can change the potential in the canal, the micro-organisms which flourish there would find no subsistence. In my mind this line of work, if carried out, will meet a demand for which there is no satisfactory supply. It has been my endeavor to define the *principle* governing dental caries; if the proofs are convincing to members of the Odontological Society I will feel rewarded. I leave the matter in your hands, with a desire that the above suggestions be carried out so that root-filling may be as scientifically done as we already witness in filling crowns.

METALLIC *VERSUS* THE PLASTIC BASE FOR ARTIFICIAL DENTURES.<sup>1</sup>

BY I. NORMAN BROOMELL, D.D.S., PHILADELPHIA.

WHILE the reputation of the dental profession in general has been gradually advancing in regard to their knowledge of therapeutics, and in the treatment of oral diseases, together with a still greater advancement in all operations upon the natural teeth, there has not been a corresponding progress in prosthetic dentistry. The existence of this condition will hardly be denied, therefore the acceptance of its truth naturally leads us to inquire into the causes producing it.

Numerous reasons might be assigned for this rather unfortunate circumstance, but to my mind no one cause has been so instrumental in producing the result as the introduction of the plastic or vegetable compounds as a base for artificial teeth. It is very true that these have their place in dentistry, and circumstances frequently occur when it would appear almost impossible to succeed without them; but it is not the use so much as the abuse of these materials that has been working the damage. First, as to their use. Celluloid and zylonite having proved themselves insufficiently durable, my remarks shall have no reference to them, and I shall consider vulcanite rubber as the only plastic base now in use. What are the circumstances under which rubber can be used to best advantage? Undoubtedly in full dentures, when great absorption has taken place, and something of a plastic nature is required to give sufficient bulk to the denture, to re-establish the proper contour and fulness.

It would be difficult to find a better material from which to construct an interdental splint than vulcanite rubber, while in full metal dentures its use as the means of attachment is invaluable. Under these few conditions rubber may be used to advantage.

Now as to its misuse and the ill results accruing therefrom. What are some of these ill results? *First*, a lack of any thought or care for prosthetic dentistry by the best members of the profession, with a consequent decline of this branch of our calling, and a desire to separate from it. *Second*, the advancement of quackery. *Third*, a desire upon the part of those persons who place a greater value upon the absence of pain than they do the presence of their natural teeth, preferring to part with these precious organs and

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<sup>1</sup> Read before the Odontological Society of Pennsylvania, April 14, 1894.



substitute artificial ones. *Fourth*, an increase in diseased conditions of the mouth, both of the soft tissues and of the teeth themselves.

The first ill result is certainly one to be deplored, much harm frequently coming from the growing desire of many members of the profession to shun mechanical work. To my mind the perfect dentist, the dentist most able to comprehend the wants and needs of his patients, must give equal attention to each branch of his calling, be it operative, therapeutic, or prosthetic. To do this it is not necessary that he should actually perform all these duties himself, but his mind should be instrumental in controlling them, permitting no prejudice to make him give all thought and attention to operative work, with an utter disregard as to what may be the ill results of his inattention to prosthetic work.

By way of illustration permit me to report a recent case in my own practice. The patient, a lady, had for a number of years been under the care of a prominent dentist in another city. Upon examining her mouth I found a number of perfectly-inserted gold fillings, plainly showing that the operator possessed much skill in this direction. I also found the upper bicusps and molars on the left side as well as one or two teeth upon the right side to be missing. For a number of years the lady had urged her dentist to construct a plate for her, or in some way close up the deficiency. This he refused to do, saying that she could not wear a plate on account of a bony ridge in the hard palate. Every time she called upon him she made the same request, and always received the same negative reply. The experienced dentist may well know what had taken place by the time she came into my hands. Existing as there did a marked disposition to pyorrhœa alveolaris, the lower teeth from the want of occlusion had left their sockets, and most of them were striking the gum in the upper jaw, thus excluding all possibility of remedying the trouble without extracting the lower teeth. And yet this practitioner, wedded, as he must have been, to operative dentistry, stood idly by and permitted these teeth to be lost, or worse than lost, as they were rendered absolutely useless, simply because he could not exert himself sufficiently to prevent it. What excuse could be offered for such gross neglect of duty. Certainly the ridge in the hard palate was not sufficient to bar all possibility of inserting a partial denture, and even admitting that it was, a small clasp plate could have been constructed, and it would have been many years before the clasps would have caused the utter destruction of so many teeth, and it is doubtful if they would ever have done so. The conclusions to be drawn from this

case are these. Had vulcanite never been introduced into the dental laboratory, it is safe to assume that this "operator" would have had a better schooling in metal plate-work, and having this extra knowledge, he would have used it to advantage by constructing a partial denture for the patient, and thereby preserved the teeth which she is now compelled to sacrifice.

The second ill result, the advancement of quackery. The standing of a profession is known by the acts of its members. Who are the members of the dental profession? It is to be feared that the public look upon all dentists as members of it. Probably in a measure they are. All quacks may be dentists, but fortunately all dentists are not quacks. Vulcanite rubber is the nucleus from which sprang dental quackery. Can we for a moment suppose that this class of dentists would exist in such great numbers if they were compelled to form all their dentures upon a metal base?

The third ill result, a desire upon the part of those persons who place a greater value upon the absence of pain than they do upon the presence of the natural teeth to part with these precious organs and substitute artificial ones. How frequently do we hear our patients remark that they intend to have all their teeth extracted to make room for a lifeless substitute. Would such thoughts occur to them if they were compelled to pay the price of a gold plate to accomplish their desires? These people imagine they would be losing nothing and gaining everything. How frequently and how cruelly are they disappointed. Think of the changed expression, the lost lines of nature's beauty, the impaired articulation; with all these lost they have probably gained the coveted absence of pain, but the price has been the loss of that which, as God's creatures, we are given and bound to preserve, nature's own cheerful countenance.

For the sake of argument we will imagine the majority of all our patients to be poor, and the existence of this unfortunate condition promotes the idea of economical dentistry. Naturally enough they look upon the extraction of their teeth and the insertion of a plate as true economy. How much greater benefit could they frequently receive by appropriating the money thus expended by attempting to preserve those few teeth which were defective at the time that they had them *all* extracted regardless of their condition.

The fourth ill effect, the increase in diseased conditions of the mouth and teeth. This result of itself should be a sufficient argument to cause every conscientious dentist to make an effort to overcome it by giving more thoughtful advice in regard to artificial

work. Besides the inflamed condition found in the mucous membrane produced by the non-conductibility of the rubber, there is the more serious fault of the production of decay about the necks of the teeth owing to the ill adaptation and unnecessary thickness frequently found upon a rubber plate at this point.

Furthermore, the congested and inflamed condition of the mucous membrane causes additional trouble by producing an unhealthy vascular and nervous supply to the alveolar border, sooner or later causing rapid absorption of that process, and a consequent loosening of the remaining teeth. In the examination of fifty-three mouths, wearing either a partial or entire denture upon a plastic base, this condition was plainly discernible in forty-four of them, the remaining nine showing little or no detrimental result. So far as my observations have informed me, it requires from four to five years continual use of a rubber plate to produce the most disastrous effects, the most aggravated results appearing in those patients wearing their dentures while sleeping.

Having thus enumerated a number of unfavorable results produced from the misuse of rubber, together with the circumstances under which it may be advantageously used, it yet remains for me to briefly speak of the good and bad in metallic bases. First as to the metals to be used for this purpose. *In the proportion that gold is the best metal to be used in filling teeth, a corresponding preference should be given to its use in the construction of plates.*

Silver, while much to be preferred to rubber for small partial plates, can only boast of its cheapness as a further recommendation. The weight of aluminum is all that can be said in favor of that material. As I have previously admitted, while it is not possible to use gold in every case, it is certainly deserving of a more general use. It has for its advantages, conductivity, perfect adaptation, cleanliness, strength, and lack of bulk. In the fifty-three mouths previously referred to as wearing rubber plates, twenty-two of them were replaced with gold as a base. Every one of them soon began to exhibit a marked improvement, and those which it was possible to keep under observation resulted in a complete transformation, the inflamed, spongy mucous membrane having disappeared, while teeth that were much disturbed have taken on new life. What other changes might be brought about by a more generous use of this precious metal? Many of the ill results produced by the indiscriminate use of rubber would be overcome, mechanical dentistry would soon have a fascinating influence over the average practitioner, and the desire of divorcement of the two branches of our

work would disappear, producing altogether a more generous and more useful profession.

To encourage a more general use of metallic bases, I have devised a method by which the swaging process is much simplified. The principle, while not entirely new, is nevertheless new in its application. By this method I dispense with the use of the horn mallet almost entirely, permitting a series of counter-dies (which I have named "progressive counter-dies") to perform the work previously accomplished with the horn mallet. The die is formed in the usual way, and the series of counter-dies are formed in the manner illustrated upon the black-board.

It may be argued that a plate swaged in this manner will not retain its shape so well as one coaxed into position by the use of the mallet. My idea is this, that the force of the blow being equally distributed to all portions of the plate, the result is the formation of a plate which will be much more rigid than one swaged in the old way. However, this may be a point for argument, and I hope to hear some remarks in reference to it.

No matter how great care is taken in swaging a plate with the horn mallet, every blow of the mallet is bound to be recorded upon the surface of the plate in the form of a bump, or a depression. These inequalities, while not necessarily visible to the eye after polishing the plate, may be plainly detected by the touch. The saving of time is a consideration. I have two plates here, one of them being swaged in seven minutes and the other in five. There being no scratches or imperfection in them, it only requires a few minutes' use of the brush-wheels to accomplish this part of the work.

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## THE EDITORIAL FUNCTION.

BY HENRY BURCHARD, M.D., D.D.S., PHILADELPHIA.

How many of us appreciate in a full degree the importance—the vital importance—of an editor's work? How many recognize the true part he plays in matters relating to our profession?—that he is not a machine for punctuating and paragraphing essays, but a living, active force in whatever work he may be engaged?

Some forty or fifty years ago, when dentistry was in a chaotic, or, at least, an inchoate condition; when dental practitioners of the

better type were extracting from the half-concealed charlatanism of dental carpenters the material from which to build a profession, editing might and could have been viewed in a careless or an uncritical manner. The field then covered called but for slight ability to meet all needs.

With rare exceptions, the material furnished for discussion was mainly speculative, tentative thinking on the way to science, so that much latitude could be taken and allowed as to the acceptance or rejection of articles.

Since then the growth has been constant, a steady advance, until now the pseudo-scientific is relegated to its proper position and the scientific receives endorsement.

Editors are popularly and truly supposed to be the educators of their readers, this not alone through their own literary work, but by the material selected for the readers' perusal.

It is not necessary to state explicitly, as is done in the Chautauqua text-books, that the editor or journal is not responsible for, nor does he endorse, all the views and opinions enunciated by a contributor. However, the acceptance and publishing of articles is endorsement in some measure; he may not accept as truth, or be persuaded by all he publishes, still the fact of publishing is a tacit recognition that the printed article is worthy of the attention of readers. This may seem to have no direct bearing upon the practice of dentistry. Perhaps it has not; but it is of vital importance to the science of dentistry.

Complaints are general that many contributors to the journals, and many of those who take part in the discussion of essays in society meetings, constantly ignore the general principles upon which dental science is based. So many work and reason without due recognition of the principles of general science, that the results of their work become well-nigh invalid. Many fine-spun theories and bold hypotheses, seemingly fair to the casual glance, are, by a species of *reductio ad absurdum*, resolved into self-contradiction or drivelling puerilities.

We know, of course, that the cure of this state does not lie with the editor, and presumably it is a matter of regret that this should be true; but, fortunately, he has in his grasp, if not the reversing apparatus, the brakes to apply.

It is the use of these brakes which distinguishes the editor of mind from the editor of the scissors. The word editor is applied, of course, to the man who discriminates as to the worth of unpublished matter. He who clips the already-printed is not an editor,

but a journalistic tailor; it is steel shears in contradistinction to brains.

One naturally expects as a first characteristic in an editor that he possess what is known as the judicial cast of mind,—that is, the capability of comparing and weighing statements and evidence presented to him.

In one meeting a half-dozen conflicting sets of views may be presented, and in that meeting no balance is struck; each advocate carries with him a confident belief that his views are the correct ones. It is here the well-equipped editor plays his part. From the tangled maze of controversy he unravels the many lines, lays them in a row, and measures their relative worths. The writer once stated in an essay "that dentistry had no court of appeals." The recantation is here: the court exists in the sound professional editor, for he weighs after the evidence is all in.

As every man's baby is finer than his neighbor's, and doubly outweighs the offspring of his antagonist, each stands to his own opinions. The fact of a man having a bias warps his judgment; so the sound and rational opinion must come from one who has no pet child to coddle.

The editor has before him, in panorama the pictures of his immediate science and those collateral; the chance writer has dangling before him an edge of one of these pictures, sees but that fragment, and how can he think beyond it; and how can an editor see but in his field of vision. All men have an intellectual horizon; according to the man, this may be six inches, six miles, or in some instances be well-nigh boundless. It is for breadth of horizon that editors should be, and presumably are, selected. Though it is important that each learn exhaustively all that lies in his particular circle, it is more important that this annular journey should have as large a circumference as is consistent with easy grasp.

At the extremes we have the data-hunter and the generalizer—the microscopist *per se* and the cosmologist. To which of these does one turn when he desires formulated knowledge. To one the  $\frac{1}{8}$ " objective, the chemical-balance spectroscope or telescope is a means to an end, an incidental in the reasoning to principles. To the other the field of his objective is his horizon, the spectrum the only arrangement of colors; all the universe may be weighed in his scales, and these instruments make his world.

Who can deny that, although it is a requisite to have fact-finders, phenomena-recorders, and data-searchers, it is equally important that we have the results of their work generalized and

systematized; to have an impartial viewer blow, and blow hard, the wheat from the chaff; for to give us wheat alone is the editorial function.

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## METHOD OF MANIPULATING GOLD AS PRACTISED FIFTY YEARS AGO.<sup>1</sup>

BY F. B. SMITH, M.D., NEW YORK CITY.

The method of manipulating the gold as practised by Dr. Eleazer Parmly in filling teeth fifty years ago may have had some points of merit that possibly may have been overlooked, and may be unknown to some of you present this evening.

Having seen stoppings that were put in by him and had remained preserving the teeth forty and fifty years is sufficient proof that his method of filling teeth was not without merit, worthy of our consideration and careful investigation, and possibly the points of the pluggers used by him were well adapted to that style of filling, and even better, perhaps, than any of the many varieties that have been used since.

So long as the object of filling teeth is or should be to preserve the teeth for the longest possible time, the best means how to accomplish that end should ever be the ardent desire and never-ending study of every dentist, and when we disregard the laws of nature and those that aid us in manipulating gold we surely must be on the wrong track.

Dr. Eleazer Parmly took gold in square form, laying three or four pieces one upon the other, according to the size of the cavity to be filled, with the plugger point in the centre, and giving the gold a twist at the end of the plugger point, and placing it in the cavity, pressing it in and around to the walls, then turning the gold above the cavity over into the centre of the gold, leaving a well-turned edge all around the margin and a well-formed cavity in the gold; then another layer of gold arranged the same as was the first, and packed in the same way, and so on until the cavity is full, and finishing the stopping in the centre of the gold, always carrying the point of the plugger in the same direction, the same as if turning in a screw from first to last, twisting as it were the gold down into the cavity. In this way of packing gold the

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<sup>1</sup> Read before the New York Odontological Society, June 19, 1894.

plugger never comes in contact with the wall of the cavity, and there is less danger of bruising or breaking down the canals or tubules of the bone, and the cut-under shape of the cavity is retained in each layer of the gold as it was put in, thus securing the last piece of gold as securely as the first.

Some years ago when operating for one of Dr. Eleazer Parmly's former patients, I found a large crown stopping in a lower molar tooth that the lady said was put in by Dr. Parmly some twenty years before; it apparently needed renewing; the gold was so soft on pressure with the instrument it led me to suspect considerable decay under the gold. When I took the gold out the cavity was as perfect and free from decay as it was the day it was formed, as round and smooth as a bur-head could make it; the cut-under was hardly perceptible. I refilled it as it was.

Some three years ago I saw a tin stopping put in by Dr. E. Parmly when his office was in Park Place, still remaining and preserving the tooth. The reason for filling it with tin, the lady said, was that the nerve was so nearly exposed the doctor considered it a safer material than gold, as it required less pressure in putting it in.

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## REPLANTATION IN CHRONIC ALVEOLAR ABSCESS.

BY GEO. A. SULLIVAN, D.D.S., ALBANY, N. Y.

CONSERVATIVE dentistry has made rapid progress in recent years, and the dental profession must look with favor upon an operation by which diseased teeth can be restored to health and usefulness after all ordinary methods of treatment have failed.

Every dentist is familiar with the distressing condition presented in cases of chronic alveolar abscess and acute and constant pericementitis, cases which, in spite of every effort, will continue in a more or less inflamed condition. My method of treatment in those cases may be of interest.

My experience has extended over a period of six years, and in that time I have extracted and replanted fifteen teeth, four of which were lower molars, and I cannot report a single failure.

The operation of extracting and replanting an anterior tooth is a very simple one, and, if done quickly, the tooth need not be out of the mouth longer than ninety seconds, and I may add that it is



an unnecessary waste of time to cut off the end of the root and cap the apex with gold. If the tooth is a little longer than the adjacent ones, it is much better to trim off the cutting-edge. I have only found it necessary in cases of bicuspid. I believe most failures are caused by sacrificing too much pericementum.

In performing this operation, prepare a glass of boiled water, to which add three or four drops of five-per-cent. alcoholic solution of hydronaphtol; wet a corner of a napkin in this water, and when the tooth is extracted wrap the wet corner of the napkin around it, cut off the abscess sac,—but as little pericementum as possible,—and remove all septic matter from the pulp-canal by drilling from the apex towards the crown; moisten the pulp-canal with chloroform by using a broach with a few fibres of cotton wound around it; insert a gutta-percha canal-point, and trim off the protruding end even with the end of the root; syringe out the alveolar socket with the prepared antiseptic water, insert the tooth, and ligate it to the adjacent teeth.

In two weeks the tooth will be as firm as any in the mouth.

I cannot understand why a dentist will treat a case of chronic alveolar abscess from six months to two years when the tooth can, by this operation, be restored to health in two weeks.

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## HEMORRHAGES AFTER EXTRACTION OF TEETH IN HEMORRHAGIC DIATHESIS AND SPONTANEOUS ANÆMIA.

BY D. A. ROSENTHAL, D.D.S., PHILADELPHIA.

THE extraction of teeth, being an operation that nearly every dentist is called upon to perform, oftentimes results in hemorrhages requiring most energetic treatment to check.

Especially is this true in cases of "hemorrhagic diathesis and spontaneous anæmia," where the blood will continue oozing in spite of all local treatments.

It will be found necessary and of great value to administer remedies tending to correct the abnormal condition of the blood, and which would promote contractility of the blood-vessels.

Depressing the action of the heart is, under all circumstances, an admirable step towards the checking of the hemorrhage.

*Veratrum viride*, gtt. iv in a tablespoonful of water, every three

hours, will be found beneficial. Twelve drops will generally cause the desired effect.

In "spontaneous anæmia," the proportion of red globules may sink as low as six or four per cent., which makes it about seven to nine per cent. less than the normal proportion of red globules to the whole blood.

The red globules, when lost, are regenerated slowly, and when hemorrhages are frequent, the effect on the quality may become serious. The blood becomes watery, rendering it very difficult to control hemorrhage.

In cases of spontaneous anæmia, the vital powers of patients are very much reduced. Patients exhibit marked debility, and it requires careful treatment to effect a cure.

The following tonic, as recommended by Dr. A. H. Smith, is very good.

R Hydrargyri chloridi corrosivum, gr. j;  
 Liq. arsenici chloridi, gtt. xlvij;  
 Tinct. ferri chloridi,  
 Acidi hydrochlorici dil., aa fʒiv;  
 Syrupi, fʒij;  
 Aqua, q.s. ad. fʒvj. M.

Sig.—A dessertspoonful in a wineglassful of water, after each meal.

Doing considerable extraction, I had a few cases of profuse hemorrhage, and the following treatment resulted in its immediate control:

Illustrative example:

Miss B., about seventeen years old, came to my office, and had the second inferior molar extracted.

The tooth was very much affected by caries, and its removal was decided upon. The tooth had an inward curve at the root, which made it rather difficult to extract without a little more than the usual force, and possibility of fracture.

After the tooth was removed, the patient complained of slight pain, undoubtedly due to the extra movements occasioned by the caries at the roots. I also noticed that the hemorrhage was rather unusual, but thinking that it may have been due to the inflammation of dental membrane, I simply squeezed together the pressed-apart alveolar process, and dismissed patient with usual directions to rinse mouth with salt water.

Two days after, patient came complaining of profuse hemorrhage after leaving my office, asserting that she nearly died from hemor-

rhage after the extraction of a tooth while in Italy. Her father also had a similar experience.

The patient was weak, felt faint, had cold hands, was suffering from muscular and general debility, and looked very anæmic.

I had the following prescription filled, and after having administered one dose, I proceeded to the local and mechanical treatment, as will be seen below.

R Tinct. digitalis, fʒiss;

Tinct. catechu, fʒj;

Extr. ergotæ fl., q.s. ad. fʒij. M.

Sig.—A dessertspoonful every two hours.

After syringing sockets with hot water I dipped a few pieces of absorbent cotton (tightly formed) in tannic acid, and placed them one by one into the alveoli or root cavities, until they were tightly and fully filled. Then placing a piece of rubber dam over the filled surface so as to prevent somewhat the tannic acid from mixing with the saliva, I placed a piece of warmed wax with "plug-retainer," as I call it, asking patient to bite, always observing that such should be normal. After this I made a firm bandage as modified by Professor J. E. Garretson, which is as follows:

I took a strip one and a half inches wide, and one and a half

FIG. 1.



yards long of rubber material; placed centre of strip against chin of patient; carried the ends up, crossed on forehead; carried around sides of cranium, crossed at the occiput; carried forward, and tied in front of the chin as represented in cut (Fig. 1).

Saw patient in two hours, and after removing bandage, found

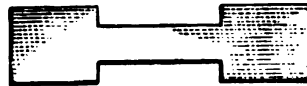
slight sign of hemorrhage. At this time patient took some liquid food and another dose of medicine; rebandaged and dismissed her. When seen next morning I removed all dressing, and found that hemorrhage has entirely ceased.

With this method of treatment I have been successful in stopping every case of hemorrhage I had to deal with. It is well to observe that the pieces of cotton be placed in the root-sockets in such a manner that the bony part partitioning them off should not serve as a preventive of packing them solid, as failure in reaching the depth of root-cavities will serve as an obstacle in obtaining satisfactory results.

FIG. 2.



FIG. 3.



This plug-retainer (Fig. 2) will prove of admirable value in helping to retain all applications in cases of hemorrhage after the extraction of teeth. It can easily be adapted to any part of the mouth.

You can make it yourself at any desired moment, but it is better to have one on hand so as not to lose time when it is wanted.

Take a piece of metal about twenty-four gauge, and cut into shape of Fig. 3, bending the wide ends, slightly inclining them forward, as represented in Fig. 2.

Always place a small pad of cotton over cross piece, and patient is ready to bite. It will sooner or later do the dentist great service if he will find room in his dental cabinet for a roll of unbleached muslin about one and a half inches wide, impression-wax, plug-retainer, and pellets of cotton dipped in tannic acid.

## Reports of Society Meetings.

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### NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, June 19, 1894, at the New York Academy of Medicine, the President, Dr. Brockway, occupying the chair.

The minutes of the previous meeting were read and approved.

#### INCIDENTS OF OFFICE PRACTICE AND CASUAL COMMUNICATIONS.

*Dr. Bogue* (having exhibited three teeth slightly eroded).—These results of an experiment, which I have shown you before the meeting, is a repetition of one which I saw performed by Dr. Michaels, of Paris. He made the extraordinary assertion that sulphocyanide of potash would produce the erosion which we frequently see upon teeth, and for which we have been unable, ordinarily speaking, to find a cause or a cure. He showed me two capillary siphons at work, one drawing water from a bottle onto a tooth, and the other taking the water back to another bottle. The other day, after the little discussion which we had at our last meeting, I took sulphocyanide of potash, which, by the way, I got at Eimer & Amend's, and, dissolving one part in a thousand of water, let it drop upon these three teeth by means of the siphon, drop by drop, so that from Saturday morning until a few minutes ago there has been a constant dropping upon these teeth. You will have noticed that the erosion is plainly distinguishable on these teeth. If any gentleman cares to repeat these experiments, I will take the liberty of asking him to look with the microscope very carefully at some specimens of natural erosion, and then compare them with teeth acted on by the brush. He will perhaps see the same polished surface as is exhibited in one of the teeth here. Sulphocyanide of potash gave a slightly acid reaction to my litmus paper, after it had been lying wet all night. It is found always in the saliva, and nowhere else in the body. I have seen three analyses, one of them giving six-tenths of one part in a thousand, another seven-tenths, and another nine-tenths. I am very glad to bring this

experiment before you, giving the credit of it to Dr. Michaels, and hope some other gentleman may see fit to take up this matter and continue the experiments and study.

*Dr. Starr.*—May I ask how you use the siphon, whether you let it drip directly on the teeth?

*Dr. Bogue.*—Yes. The end of the tube was not much larger than the end of your pencil. It dropped the fluid on the teeth continually. Dr. Michaels's apparatus was different. He took only one tooth, and as the drop fell onto the tooth, another siphon took it away and carried it into another bottle. This experiment only lasted from Saturday morning until before I came to the meeting to-night. I believe the teeth are still wet as when I took them out. I looked upon it last summer as a discovery of great importance. I tried to have it brought before this Society, but was unsuccessful. The secretary's remarks upon the erosion proceeding in the manner in which it has showed that it could not be due to wear.

*The President.*—I have long been satisfied that the tooth-brush theory did not account for the erosion we have seen.

*Dr. Howe.*—That experiment is exceedingly interesting and very valuable, and suggests the agent by which, possibly the solution is effected in erosion. I want to contribute a little fact on the subject that came under my observation within a week or two. I saw erosion for the first time, I think, on the deciduous teeth of a child six years and four months of age, affecting the cusps of the cuspids and premolars. The child had always been, and was then, very healthy. Both parents of the child have erosion on their teeth, the father's being extensively wasted.

*Dr. Francis.*—Did the surfaces present a polished appearance?

*Dr. Howe.*—Yes. They presented a smooth polished appearance, in cup-shaped depressions, and the teeth were without decay.

*The President.*—I have seen such cases in temporary teeth.

*Dr. Bogue.*—One of the gentlemen asked, a moment ago, if sulphocyanide of potash produces this effect on one tooth, why it does not produce it on all the teeth in the mouth? I think the question would naturally be borne in mind by all investigators; and with it would come the question as to whether the presence of a greater or less amount of the substance in the saliva has an appreciable effect on the health of the patient. I think in all cases of erosion we find a lower condition of vitality than what we would regard as normal. I do not know that I am correct, but I venture to call attention to the points that happen to occur

to me. It may be true that we have in this affection a diagnostic symptom of importance.

*Dr. Howe.*—I would like to ask Dr. Bogue if he meant to raise the question whether a variable amount of this compound in the mouth had an effect on the health of the patient, or whether it was that a greater or lesser amount of the sulphocyanide of potash in the saliva was an evidence of health being better or worse.

*Dr. Bogue.*—The latter is what I meant. It is a diagnostic indication.

*Dr. Howe.*—I understood him to raise the question whether this agent had an effect on the health.

*Dr. Bogue.*—I should not dare to put it that way just yet. We do not know enough about it.

Dr. Smith then read a paper on a "Method of manipulating Gold, as practised Fifty Years Ago."

(For Dr. Smith's paper, see page 627.)

Dr. S. B. Palmer, of Syracuse, also read a paper, entitled "Review and Revision of Practice."

(For Dr. Palmer's paper, see page 610.)

#### DISCUSSION.

*Dr. Palmer.*—I would say that much of my paper cannot be understood by a hasty reading, nor could I put twenty-five years' practice into so short an article to have it understood. So far as this subject is concerned, I shall not be annoyed at any question that may be asked.

*Dr. Littig.*—You spoke of lining the cavity with tin before putting in the amalgam. Would an amalgam of pure tin answer the same purpose?

*Dr. Palmer.*—It would be a good amalgam, but it is so soft it would wash out. Still it would be an improvement as a conductor. If you know the law, silver stands at a conductivity of one thousand and tin at one hundred and forty-five, so there is a vast difference.

*Dr. C. E. Francis.*—Dr. Palmer has given us a very valuable paper, which bears evidence of much careful study, observation, and experiment. I, for one, feel thankful to him for his excellent suggestions, many of which I think I can carry into practice.

Dr. Palmer's reference to the use of amalgam in poorly calcified teeth reminded me of a case which came into my hands to-day. A young gentleman called on me to have his teeth attended to. His sixth-year molars had been filled on their grinding surfaces with

amalgam. The teeth were of a low-toned character and the fillings proved a failure. I could pass an excavator between the fillings and cavity margins, where I found the dentine much softened. On the buccal surfaces of the same molars were very small fillings of copper amalgam, which were in better condition and preserving the cavities.

I have but little confidence in the employment of amalgam in children's teeth, either temporary or permanent; for observation has convinced me that three-quarters of them give out. Neither do I recommend gold for poorly calcified teeth, especially in the mouths of children, much preferring gutta-percha, oxyphosphate of zinc, or tin-foil.

Many years ago a young daughter of one of my old patients happened to fall into the hands of Dr. F. B. Smith, who is present to-night. Her teeth were much impoverished and many of them decaying. Dr. Smith filled them with gutta-percha, and they have since been refilled with gold. She is now a middle-aged lady, but still retains her teeth, and I think their salvation was in great part due to the gutta-percha stoppings introduced by Dr. Smith just at the right time.

Permit me to mention another instance showing the superiority of gutta-percha over gold in young teeth. Some years ago a young school-girl called upon Dr. Carr (who was associated with me at that time) to receive attention. One of her superior lateral incisors had been filled some two or three years previously on both posterior and anterior approximal surfaces. One filling was of gutta-percha and the other, a very tiny one, of gold, both inserted at the same time by Dr. E. J. Dunning, who was well known as an excellent operator and possessing good judgment. He evidently considered the walls of the small cavity sufficiently dense to justify the use of gold, but it failed. The tooth-structure softened around it and the cavity was much increased in size. The gutta-percha filling, however, had perfectly preserved the other cavity, which required no further excavation. You will observe that here were two cavities in the same tooth and filled at the same time by the same operator.

*Dr. Watkins.*—How old was the child?

*Dr. Francis.*—About ten or twelve years of age, as near as I can recollect.

*Dr. Watkins.*—I have enjoyed Dr. Palmer's paper very much indeed. It is very instructive, and I feel that I have learned many things from it. However, there are one or two things that I want



to say. One is in regard to using tin-foil under amalgam or gold fillings. It answers a twofold purpose. One thing which the doctor did not mention was that it is a poor conductor, and where the tooth is very sensitive the changes of temperature will affect it very much less than if it were filled entirely with gold or amalgam. I have frequently practised that in large deep cavities, where there was excessive sensitiveness, with very beneficial results. I was very glad to hear the doctor put emphasis on a remark which I made before this or the First District Dental Society, a few months ago, in regard to putting in combination fillings of tin and gold, insisting that where tin and gold is used, the major portion of the filling should be of tin, otherwise tin will be destroyed if it be the smaller portion. In regard to filling with amalgam, as long as we have been using amalgam it seems to me that we do not use it as intelligently as we should. I believe it is not taught in our colleges as it should be, and in discussions in societies it is much neglected. We go away with impressions which are entirely misleading. I believe that in putting in an amalgam filling, it is just as necessary to make that a perfect filling as it is in putting in gold. It is just as necessary to take pains with it in every particular, just as necessary to keep it dry, just as necessary for us to use our very best efforts, and I believe that is seldom done. Consequently we have failure with amalgam fillings. I believe as much as I believe anything that when amalgam is placed in the cavity that the rubber dam should be applied, because I think any man who can put in a filling at all, can do better work with the dam than he can without it. Where the rubber dam is applied, you have sufficient time to pack the amalgam properly and work the mercury out of it, and the cavities should not only be filled to the outer surface and finished off, but should be filled again and packed again and again, at different times, and the mercury drawn to the top, so you can cut down all the surface, whether it be a compound cavity or a simple cavity, until you come to good solid amalgam, and have the amalgam as near the same consistency entirely through the filling as it is possible. And if you do that there will be very little change. Therein lies the secret of success in filling with amalgam. You will have clean, dry fillings without oxidation, and they will stay and last to a remarkable extent. If fillings were put in that way, you would hear less about failures. As a rule, they are put in very differently, I think.

The doctor spoke of filling canals with gold or platinum wires.

That method has been used by Dr. Morrison, of St. Louis, for many years. He carries chloro-percha into the canal, and then forces the piece of gold wire, which has been previously fitted to the root, into the apex, twists it off, and allows it to remain there in that way, hermetically sealing the canal, and he is sure that he has something there which will not change in the cavity.

*Dr. Howe.*—This paper of Dr. Palmer's is a very important contribution to our literature, in that it presents a theory of the etiology of caries. This subject is often regarded as settled. Dr. Palmer suggests thoughts that seem to unsettle it. When Dr. Palmer says that oxygen is the active agent in producing caries, I suppose he means that oxygen is the agent that produces the acid. I do not feel prepared to discuss this subject, but some thoughts and facts present themselves to my mind that without preparation I will try to express as best I can. Dr. Palmer has referred to antiseptics as a remedy for caries, and I would like to raise the question, How much have we found antiseptics to be a remedy? The acme of antiseptic influence, for the prevention of recurrence of caries is presented, I suppose, in a copper amalgam filling, since Dr. Miller has shown that it exerts a continual antiseptic influence. Micro-organisms cannot proliferate nor exist in contact with it, nor for a certain distance around it. I suppose we all have observed, however, that decay recurs at the margin of these fillings, and proceeds to disintegrate the tooth right in contact with this antiseptic material. On the other hand, tin-foil, gutta-percha, and amalgam are—on occasion—placed into cavities which are poorly prepared, from which decayed bone is sometimes not all removed, and the material perhaps placed in wet,—and yet teeth thus filled are preserved from recurrence of decay, sometimes for long periods of time. The former fact seems to show that antisepsis is not efficient as a prophylactic, and the latter facts indicate to my mind that other influences than antiseptic ones may be sufficient to arrest and inhibit decay. I would like to ask Dr. Palmer to tell us why a tin-foil or gutta-percha filling, or even an amalgam filling, put in under such difficulties as result in leaving decay in a cavity, and introducing the material in a wet condition, is so often efficacious for a considerable time. We do know that such things occur. What do these facts mean in regard to the theory that Dr. Palmer has suggested?

*Dr. Palmer.*—Those are very fine points, but the theory perfectly explains them. The first point that Dr. Howe mentioned was about copper amalgam, which we all know preserves teeth

very well under certain conditions,—that is, when the two elements unite harmoniously. Where copper amalgam comes against enamel, the enamel will be wasted away, because of the principle upon which it acts,—the galvanic action around the copper amalgam with the saliva between it. Why does it not dissolve the dentine? Simply because the oxide has been absorbed into the dentine, taking the place of the lime that has been extracted, and has thus created an equal in potential. If you can produce an oxide of the filling, and have it absorbed into the dentine, there is no action between the two. The potentials are one. As soon as the amalgam filling is introduced, if the tooth is very porous, an action is set up in the amalgam,—that is, on the surface against the tooth the lime is soon dissolved out. You have then the same trouble as you would have with a gold filling. The dentine has not received enough oxide to satisfy and fill up the pores, and the dentine is a positive element. Dr. Brockway spoke of the deciduous teeth, which are very frail, and it is almost impossible to use the amalgam in those teeth. If you do use it, it would be best to have a lining of something between it and the tooth. Amalgam shrinks by the galvanic action upon the surface of the plug next to the dentine. The only amalgam fillings that I removed that were bright were those in which the teeth were lined by a heavy varnish. In my paper I do not go into general practice any more than I can help.

One of the gentlemen spoke of the union of tin with gold. I have practised that until I know how far mutual induction will take care of tin with gold. Gold will penetrate the tin to the thickness of one layer to two of tin-foil. That will preserve it forever. It is an alloy, not an amalgam, but the principle would be the same. If you line a cavity with three or four thicknesses as a guard filling, that portion that is preserved by the gold entering into it will be about one-half of it, and the other will turn black from the decomposition of the dentine back of it. There will be one or two layers of foil that will turn black and be soft. If you put in one-quarter or three-quarters of the tin, then there is no dissolving of the tin whatever. There is no extra dissolution of the tin, any more for having the gold with it than there is in having gold with the amalgam. It causes a rapid oxidation which ceases as quick as the oxide enters the dentine. It is a poor conductor, and we gain much in that. We gain another thing. It is easier moulded. We gain chemically by the oxidation of the tin, and it makes a preserving filling. Those are scientific points, and

I think they will answer very well what you have brought out. I took a gold plate and placed upon it some tin-foil, put it in a vulcanizer and vulcanized it. When I took it out the tin appeared black. I brushed it off, and it was bright tin. It was perfectly affixed to the gold. It contained gold, or the gold imparted to it a preserving influence that we call induction. It would not be corroded by any ordinary action in the mouth. When tin and gold are in contact the tin will be slightly oxidized. We want to know what we are doing. Why I adhere so closely to chemistry or to the science of it is that if we learn to do a thing twice, we can do it as often as we wish.

I wish to stand free from any charges against any other theory, as I contend that there are no two theories upon this subject. The fermentation is a fact and a condition. We are getting at it. Where fermentation comes in, it produces an acid and decay. The idea I present is that we can fill the dentine with an oxide. Oxide is recognized every time where there is any oxidation going on. If it is sealed up in the dentine, there is no more oxidation and no more decay. I have nothing to gain or claim through this, except for the science of dentistry. I want to know for myself, and I want the profession to know, whether I have been writing all these twenty-five or thirty years upon a subject that does not amount to enough to be mentioned.

*Dr. Watkins.*—I would like to ask Dr. Palmer if he has not noticed in those tin and gold fillings, where the majority of the filling is made of tin, that instead of the tin deteriorating as it does where there is a small quantity of the tin in the cavity and exposed, that the filling will take on itself more the form of an amalgam and become hard instead of being soft.

*Dr. Palmer.*—The surface of that filling has undergone a chemical change, and has formed an oxide that is much harder than tin. If you will go through it, you will find the same tin there. In regard to mixing tin and gold together, I can do that successfully. I got that idea from Dr. Abbott, in Berlin. Some fillings I have seen for years, in the mouth of the sister of Dr. Nash, look like amalgam, but they are harder, and there is now and then a pit in it, and sometimes a streak of gold. I experimented to find out why those pits should be in the tin. Mix the tin and gold in layers. If you fold two or three layers and it comes to the surface, there will be a pit. If you make a stack of layers of tin and gold, and use it in ribbons or cylinders, then each gold leaf will preserve one of tin. If you put it in wet, you can do so. If you

place it in without being wet, it has to undergo the electrical change, as the filling wears down; but in either case you have an absolute mixture. If you add more tin, you will have it dissolved out by electrical action. I have practised this so much that I know these to be facts.

*Dr. Howe.*—Will Dr. Palmer tell us what is the potential relation of gutta-percha to dentine?

*Dr. Palmer.*—I should think it was about equal. Conductivity would be a little more with so much of the oxide in it. Dentine is only 15. It would stand up to about 20 or 25. It depends on the amount of conducting matter that would be in the filling. There is more in the preserving properties of gutta-percha than I once supposed, so far as allowing nature to recalcify is concerned. Nature works from within upon the alkaline or positive pole of a battery. It works from the inside out, and nothing interrupts that. An acid is an outside influence. Dentine is formed in the pulp-chamber. Why is that so? Nature sets to work from the pole in which it works on the alkaline side, but if you set up any irritation there with an acid from without, you turn the current back. If you turn that back, there is no repair from within.

*Dr. Howe.*—Does Dr. Palmer mean to say there is no repair on the part of the pulp in response to the irritations of the tin?

*Dr. Palmer.*—What I mean to say is that an acid irritation, the same as produced by fermentation in the cavity, turns the current back so far as nature is concerned.

*Dr. Howe.*—I supposed that secondary dentine was deposited by the pulp in response to the irritation.

*Dr. Palmer.*—We find it to be a fact that the pulp-chamber is filled with secondary dentine caused by irritation, and the cavity can go on into the pulp-chamber; but it requires a long period to do it.

*Dr. Howe.*—The process of decay generally overtakes the pulp. Secondary dentine is not built up fast enough.

*Dr. Palmer.*—That is a point of whether the acid turns back the current instead of allowing it to continue. If you take out the metal fillings, and put in gutta-percha, that will allow nature to work. You take a gold filling and place it close to the pulp; it may last fifteen or twenty years, but as soon as an irritation takes place, and the filling is removed, there is nothing but the organic matter over the pulp. It has taken away from it what there was at first. There is something of the reversal of the current that is detrimental. Most operators are reminded of cases which seemed

perfect, where there was an irritation that produced an acid that reacted.

*Dr. Bogue.*—Where you find the clasps wearing through, there you find the secondary dentine.

*Dr. Palmer.*—You do not find it so much in cavities.

*Dr. Bogue.*—Thinking of what you said, that illustration comes to my mind.

*Dr. Palmer.*—Anything of a wearing nature that is not too rapid will cause that. That is done by another action,—not so much by reaction as by attrition.

*Dr. Bogue.*—I understood you to say that oxygen was the element in all cases, and is at the bottom of dental decay. I also understood you that oxygen is the element which is at the bottom of a process that takes place in compound fillings and prevents decay. Am I right?

*Dr. Palmer.*—Oxygen destroys dentine, which is a conductor or positive element; an oxide renders dentine negative. You are correct in the point that oxygen is the thing to prevent decay, because it oxidizes that part which the acid would attack. You did not fully understand the meaning of the term. Wherever the potentials are equal, there is no acid formed, and consequently no decay.

*Dr. Bogue.*—The word potential means latent power. Applying it to galvanic action, will you explain it?

*Dr. Palmer.*—Wherever there is a piece of metal placed in, the mouth immediately assumes what I call a potential. By attaching the galvanometer needle to it, in connection with the mucous membrane, it turns the needle suddenly. In a short time it runs down. That is a law that occurs with all metals in the mouth. You cannot place copper and zinc in a battery with water, but one pole stands at a higher potential than the other element, and that produces the decomposition. There is one of the points. If you will oxidize the other point, you get no current whatever. Take dentine, for instance, and fill it with charcoal. If you impress into it those fine particles, the oxygen would have nothing to do with that tooth. It is the same thing when you take nitrate of silver. It is bringing the positive character of the dentine into a negative state. It is the potential that you did not understand. I would introduce into a canal nitrate of silver, if it were not for the color, and leave it there, not as an antiseptic, but as a permanent oxidized material that the oxygen would not touch. Acid is a portion of the chain of action of oxygen, but potential is the effect of one metal on another.

*Dr. Bogue.*—If a zinc and carbon battery be made, the zinc has a certain amount of latent power which is set in action by the presence of carbon in the fluids. I understand the potential to be the ability to enforce that power. It means the unbalancing of those two elements, and as those two metals become oxidized, the balance is restored.

*Dr. Palmer.*—Take two metals and place them in a battery, and the negative plate is of a higher potential than the positive. There they stand like a water-tank on a building, to put out fire. When you connect the wire from copper to zinc a current flows from copper to zinc pole. It will continue to act upon the zinc until it is oxidized, and the acid dissolves the zinc, and the current generated from the zinc, passing through a circuit, does the work. Take porous dentine, and put in something that will raise it to a potential as high as the filling that comes in contact with it, and then there is no trouble.

*Dr. Bogue.*—You would not place a gold filling and a tin filling in the same tooth?

*Dr. Palmer.*—In combination fillings of gold and tin there is no current passing from one to the other in a tooth.

*Dr. Bogue.*—I mean a gold filling in one surface and a tin filling in the other.

*Dr. Palmer.*—No harm if separated by enamel a line or more; if nearer than that, connect the fillings. I could go on and enumerate many influences in regard to the mouth. I could convince any of you that if you take a gold filling in one hand, and an amalgam filling in the other, I could tell you in which hand you had the gold or amalgam. That is going further than telling it in the mouth. It goes through the body; such currents do no harm. Take two adjacent teeth and get the gold and amalgam there, and make a circuit through from one to the other, and you have trouble.

*Dr. Bogue.*—What is the trouble that will occur then?

*Dr. Palmer.*—It is an irritation of the pulp that is very serious, and I have had to remove a number of them. Also from bridges jutting up against an amalgam filling. That produces an irritation of the nerves.

*A Member.*—Which tooth is irritated, the gold or the amalgam filling?

*Dr. Palmer.*—The one nearest the pulp. It will decay most around the gold filling. There is a great deal of action on an amalgam filling. Even two amalgam fillings against each other

will cause a great irritation. I do not like to put two amalgam fillings close to each other, on account of the galvanic current passing from one to the other. I would rather use some other material. There is much more in this than I can explain here to night, of the action between approximate teeth.

*Dr. Davenport.*—In an essay that Dr. Palmer read four or five years ago, entitled "Matter and Force in the Oral Cavity," I understood him to say that a gold and an amalgam filling in the same tooth, or a gold and a tin filling in the same tooth that were not connected with each other, would disintegrate the intervening tooth-substance, and he recommended connecting them. That seems to be slightly different from that he told Dr. Bogue to-night. Am I correct?

*Dr. Palmer.*—If one is on the buccal surface and the other on another surface, I would not mind it if they were sufficiently apart, so there would not be much current. It is only when they are very close together. It will dissolve the enamel between the two and run together; but when you unite the two, the amalgam filling is better than one without the gold. This sets you right in what you ask me.

A vote of thanks was offered to the essayists for their papers, and the meeting then adjourned.

JOHN I. HART, D.D.S.,

*Editor New York Odontological Society.*

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## ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular monthly meeting of the Odontological Society of Pennsylvania was held April 14, 1894, at 1228 Walnut Street, Philadelphia, the President, Dr. E. T. Darby, in the chair.

After the transaction of routine business the essayist of the evening, Dr. I. N. Broomell, read his paper on "*Metallic versus Plastic Base for Artificial Dentures.*"

(For Dr. Broomell's paper, see page 620.)

### DISCUSSION.

*Dr. Guilford.*—The paper has proved a very interesting one, because it has dealt with what is commonly known as a practical subject. I was pleased to have it introduced, inasmuch as there are so many things connected with the making of plates that we



do not understand. In what proportion of cases the metallic base is better, or the best, and in what proportion the vegetable, is hard to determine. While there are objections to the use of vulcanite, it certainly possesses some advantages. In my practice I have had a number of cases in which I did not succeed in getting a satisfactory fit with the metallic base, where I afterwards did with vulcanite; and, on the other hand, there have been cases where I have replaced vulcanite with gold with the very happiest results; so I think there is a large field for the employment of each.

It is deplorable, indeed, that with so good a material as vulcanite we should have so many ill results; it does seem as though every good thing in this world carried with it some objectionable features. Dentistry has suffered severely from the abuse of this material as it has also from painless extraction, amalgam, and bridge-work; all of them good and useful in their places, but followed by unfortunate results when improperly employed.

I think the abuse of vulcanite has come largely through careless manipulation and from the fact that we have not understood very well how best to manufacture it. Our knowledge in regard to the proper vulcanization of rubber for dental purposes falls very far short of that possessed by those who manufacture vulcanite for commercial and mechanical purposes.

When we try a new make of vulcanizable rubber we usually find a vulcanized sample in the box as an evidence of its quality; yet those pieces are generally vulcanized in the manner that rubber is vulcanized for mechanical purposes, between steel or iron dies and under the influence of steam at a higher temperature than we use. I think, in this matter of vulcanizing rubber, that many of the misfits are due to the fact that we do not understand how to manipulate the material. There are different theories in regard to the behavior of rubber during vulcanization. We understand some facts in regard to it, but we have not yet learned why in certain cases we cannot get a satisfactory fit with vulcanite, whereas in other cases the very best results are had under seemingly similar circumstances. Rubber, during the first stage of vulcanization, expands, and during the second stage contracts. Drs. Southwick and Snow both claim that in vulcanizing rubber it should be given a chance to expand while it is in a condition to do so, and afterwards it should be kept under very heavy pressure to prevent undue contraction. Dr. Southwick further believes that in the cooling of a plate the rubber contracts towards the part that is thickest, thus causing it to rise up and leave the model in the centre where it is

thinner. For this reason the plate will rest upon the ridge, but not upon the palatal arch. He corrects this fault by reheating the plate and forcing it down in the centre after the flask has been opened.

I was told to-day by one who professed to know, in discussing this subject with him, that the large rubber rods which the electricians use, from an inch to an inch and a half in diameter, and as dense in the centre as at the surface, are vulcanized under steam at a high pressure and kept there for a long while, and that the steel moulds in which they are formed are kept under hydraulic pressure while undergoing the vulcanizing process. In this way only, he claimed, could solid and good results be obtained. We should take a hint from this and see whether we cannot improve our methods.

There are a great many points in regard to vulcanization under discussion and dispute, and it is a reproach to us that we do not understand them as thoroughly as we should. There are causes underlying the difficulties we are contending with, and I hope that in the near future we will get to the bottom of them.

In regard to the construction of metallic plates, I think success depends very largely upon our manipulation of the plaster in taking the impression and making the model, and afterwards in carefully and properly bringing the metal into uniform contact with the die in swaging.

The method of swaging described by Dr. Broomell in his paper is new, and seems to possess some valuable features. I first saw the description of it in the recent edition of Richardson's "Mechanical Dentistry," and I propose to give it a trial.

*Dr. Chupein.*—I would certainly recommend this plan of Dr. Broomell's in swaging a plate. I noticed it, as Dr. Guilford has said, in the late edition of Richardson's "Mechanical Dentistry." A plate, after it is swaged, ought to be exactly as the plate was before it was put on the die at all, only changed in form, and when it is at all stretched, as it is apt to be when driven by the horn hammer, the chances are that it will not fit at all. These successive counter-dies that are advocated by the essayist will effect this a great deal better than a horn hammer. Besides that, I am inclined to think that a plate brought up to the roof of the mouth in this way is not so much bruised as a plate would be if it was brought up by the use of the hammer.

I think there is an advantage in a gold plate over a rubber plate in certain mouths. Yet I have seen mouths that do not show what is called rubber-sore mouth, that kind of raw appearance, as fre-

quently I have seen it under a gold plate; but I am very much inclined to think under both of these cases it is more due to uncleanliness than to anything else; because I have seen gums as healthy under a rubber plate—well taken care of—as I have seen the same under a gold plate. I think there is a great deal of truth in what Dr. Guilford has said in reference to the action of rubber, or as to the manner of vulcanizing it. There is a great deal to learn in the manner of vulcanizing. I have been perfectly nonplussed sometimes in trying to find out what is the cause of porosity in rubber, and have tried all kinds of experiments to determine the reason for this defect.

*Dr. Head.*—One can readily theorize concerning the tendency vulcanized rubber has to shrink towards the thickest part, if the vulcanizing is done on a plaster model, because the plaster is destroyed, thus leaving no means of attesting the accuracy of the deductions. But if the case is vulcanized on a tin model, it in each instance will accurately fit each indentation of the metal. This would seem to prove either that plaster has some evil effect on the rubber or that no such shrinkage takes place.

The success which attends the vulcanizing under high pressure would seem problematical. We dentists vulcanize under a pressure of eighty to one hundred pounds to the square inch, and frequently find our plates porous when the highest pressure is used. It is true that certain companies may vulcanize under a still higher pressure than any used in the dental profession, but it would not seem that pressure is the one panacea for porosity, as I know of a certain rubber shoe-factory where the vulcanizing is done at forty pounds, and yet the shoes are never porous.

In the light of these facts it would appear that the warping of plates, and their tendency to become porous, has yet to be satisfactorily explained.

In reference to the paper on swaging, I would say that Frank Faber told me of a method similar to this some ten years ago, although it was not perfected to such an extent as has been shown to-night. He *never* used the horn mallet, but simply bent the gold into the counter-die with his fingers, and drove it into shape by hammering on it with the zinc die. The only objection to this method was found in the fact that high arches tended to split the gold. This difficulty the lecturer this evening has beautifully obviated.

When Dr. Faber was swaging up a plate and wished to avoid cutting out the air-chamber, he used a case of zinc that did not

run over the gums similar to the first counter-die spoken of by the lecturer this evening. With this case he drove the plate down around the air-chamber and into the interstices of the rug.

This, of course, was exactly the same principle as the one set forth this evening, but we owe Dr. Broomell many thanks for the complete and scientific way in which he has developed it.

*Dr. Chupein.*—I forgot to mention when I was up that I had an idea some time ago of how vulcanite that had sprung could be brought back to its correct shape.

We all know that if we make a vulcanite clasp around a tooth, and the patient complains that it seems to be loose, by simply oiling the clasp and heating it gently with a spirit-lamp we can bend it with the pliers and change its shape so that it hugs the tooth tightly again. If you duplicate the model in any particular case, and make one of these on tin, you can bring up a whole plate that should happen to have sprung by pursuing the same plan. Put the plate on the die and make a case of plaster on the palatal surface of the plate; and by putting it in a flask press, and placing the case, press, and all in a stew-pan of oil, and heating the oil, you can so soften the rubber that the plate may be pressed up and made to fit the die accurately without the trouble of doing the whole work over with the chances of another misfit.

*Dr. Bonwill.*—Let us be liberal to one of our greatest aids for good,—the accused rubber plate.

Many who may not have used this article for plates have been very glad to make the so-called Coffin plate from this material.

How many of the graduates of to-day can make a respectable plate of any kind?

When in practice in Delaware, up to 1871, I had largely to deal with plate-work. I place in more gold than rubber, yet I am unwilling to concede the palm to the noble metal.

You are all aware that if gold were the only material endorsed by the societies, how very few of the poor would ever be able to wear artificial teeth.

While gold is the most valuable material for partial sets, yet rubber is not as bad as it is represented to be. I have used it for many years, and have yet to see the first effect of poisoning by the presence of mercury or through its non-conducting properties.

The subject was then passed, and the President called upon Dr. Rhone, of Bellefonte, formerly President of the Pennsylvania State Society, who had an obturator which he desired to exhibit.

(For Dr. Rhone's paper, see page 545.)

DISCUSSION.

*Dr. Guilford.*—Do you treat the soft palate in any way before taking the impression.

*Dr. Rhone.*—No.

*Dr. Guilford.*—No trouble?

*Dr. Rhone.*—No.

*Q.*—This bulb is solid?

*Dr. Rhone.*—Yes. My first experience was with a hollow bulb with a spring. That was unsatisfactory. I removed the spring, as the bulb was too light. I changed that for solid rubber, which has proved very satisfactory in this case. The bulb placed under in that way forces the instrument up in the upper parts and closes the nares entirely for the time being. The patient can breathe with it in place with the mouth closed comfortably. With the rigid obturator no part will move without moving the whole, and the difficulty she had was that the teeth, for instance, would suddenly move up and down. That, of course, is entirely obviated now, and she is perfectly comfortable.

*Dr. Deane.*—The subject of obturators is, in a measure, new to us as a society, but I have had some little experience with them. I find the most successful joint is the ball-and-socket joint, with which the parts to be restored can be thrown from side to side by the divided muscles of the soft palate while talking. It fills the space better and you secure better results. You do away more with the nasal twang. The rubber bulb, especially where you are trying to restore speech, can be handled easier and better than the uvula fastened with the hinge-joint.

I also find a great deal of benefit in those cases in using, first, soft rubber velum. This is made by vulcanizing two pieces or flaps of soft rubber together and attaching it to a plate with a pin-joint. You can move this up and down the rod or pin for the space of a quarter or half an inch until you find the proper point of articulation. This is a subject for experimental practice, and after your patient has worn an appliance of that kind through the experimental stages, you will find the general result will be much more successful when you put the hard rubber palate into the mouth.

My system of taking impressions differs a little from the Doctor's. I simply take an impression as for the ordinary hard-rubber plate, extending the rear portion back in the centre, in the form of a dovetail, and finish that plate up, adding any teeth that may be missing and banding teeth when possible; to this I would affix a

bulb of impression compound, being careful to fasten it securely to the dovetail of the plate; this can then be kept warm and moulded to fit the open space in the cleft, both above and below the flap of divided tissue. I should think the Doctor would stand a chance of having severe trouble with the plaster impression shown here.

*Dr. Rhone.*—No; I have made it a point to have the patient bend forward and throw the head back, so that this could not possibly occur.

*Dr. Deane.*—That would eliminate the difficulty to a certain extent, but I should be very much afraid in those cases; they don't seem to have the ability to handle the muscles of the palate and throat, and such patients could not render any assistance at all. I came near having an accident, in a case of that kind, which led me to do away with impressions of the soft palate and adopt the modelling compound.

I have in mind a case of a child seven years of age which I treated with the soft rubber velum; the child is now twelve or thirteen years of age, and while the face and lips are disfigured he articulates well, and can sing and pronounce his words accurately, but after taking the plate out you can't understand a word he says. The experimental stage was the worst with soft rubber, but with hard rubber in his mouth he gets along very nicely.

*Dr. Guilford.*—In the few cases of cleft palate I have had I have found difficulty in taking the impressions, because the soft palate was so sensitive to the touch. I have generally found it necessary to treat the parts in some way before attempting to take the impression. Some operators recommend the application of camphor-water; others, manipulation with the fingers; but I have found that weak doses of bromide of potassium administered internally every three or four hours for a few times before the operation is sufficient to allay sensitiveness in cases of that character.

The plan spoken of by Dr. Rhone is very similar to that used by Dr. Baker, of Boston, in which he also uses the hard rubber bulb.

*Dr. Rhone.*—In regard to the hollow bulb, I experimented with that in this case first. I found it too light. It didn't drop when it should have dropped. This drops very nicely. There is no undue pressure on the mouth of this patient.

## HARVARD ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the Harvard Odontological Society was held April 26, 1894, President Eddy in the chair.

## DISCUSSION ON USING THE MATRIX.

*President Eddy.*—A number of the members present were with us this afternoon at the clinic given by Dr. Werner illustrating the putting on of matrices. Perhaps some of the gentlemen would like to express their opinions on this interesting subject. I will first call on Dr. Werner.

*Dr. Werner.*—To talk intelligently on a clinic after it is over is difficult; that is one of its disadvantages. A clinic is pre-eminently an event to be present at in order to appreciate its value. I was asked to bring a few things that we used this afternoon for the benefit of those who were not present.

The matrix that seems to answer the greatest number of cases is a thin, cold-rolled steel, such as may be found in any hardware store. I get large strips, twelve to fifteen inches long and four to six inches wide. The very thinnest will please you best, as it is very elastic and can be concaved readily, and you can cut it in strips varying in width. Try one of those little slips and fit to the length that you want, cut off a little piece with your scissors, concave it with a bayonet-shaped instrument, and you have a little piece of steel concaved to the shape that your filling is desired to take. Then adjust it at the cervical wall with a little wedge, gutta-percha, or the Perry separator,—either one or all three, as the case may seem to require. Just in proportion as you are skilled in putting on the matrix, will you lighten your labors in the filling of approximal surfaces. Ten minutes is a long time to spend in making and adjusting a matrix, and after the matrix is on, an hour to an hour and a half at the most is sufficient to fill a very extensive surface of bicuspid or molar; the finishing can be done in half an hour, so that an approximal surface in a bicuspid or molar can be filled with gold in two hours, while with any other system it takes three hours, and you have not such a condensed gold filling. I believe thoroughly in gold. With gutta-percha and the cements we are simply patching over for six months, and when the patient comes back those teeth are worse to fill than ever. Wedge the teeth completely apart, no matter how long it takes; then fill the tooth firmly and you are done with it.

Here is a model that will demonstrate the kind of surfaces that are so difficult to reach. I am going to show the models of this case filled in contour later on. I will also pass around a few of the instruments that I use. These pluggers are taken from the Darby-Perry system, but enlarged and thickened at the shank for non-cohesive work. You can have tin and gold at the cervical wall in very difficult cases, and in cases that go under the gum you can fix and adjust your matrix before you put on your rubber dam. I have never seen a matrix put on by any one, but I use it invariably for all approximal surfaces that have any opening through the crown, and all naturally large decayed surfaces have. With the matrix it is not necessary to have an undercut at the weakest part of the tooth. You put your non-cohesive in and hold it there with an instrument, packing firmly. It will not hurt, because the tooth is supported by the matrix, and when you get a good foundation then finish with rolled cohesive gold, such as Williams has in high numbers,—say No. 40 or No. 60,—burnish thoroughly, and you have an ideal contour filling.

*Dr. Clapp.*—Mr. President, it seems to me that we receive great benefit from these clinics. The operation performed this afternoon was artistic, scientific, and practical in every particular, and it shows that contour work can be rapidly and well done. I must say that I have great respect and admiration for contour work.

*President Eddy.*—Under the head of Presentation of Specimens, I shall call upon Dr. P. W. Moriarity, who has a patient here in waiting.

Adjourned.

HENRY L. UPHAM, D.M.D.,  
*Editor Harvard Odontological Society.*

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## NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE Eleventh Annual Session of the National Association of Dental Faculties was held at the Hygeia Hotel, Old Point Comfort, Va., commencing Saturday, August 4, 1894; the President, Dr. H. A. Smith, of Cincinnati, in the chair.

The resignation of Dr. J. E. Cravens as secretary was accepted, and Dr. Louis Ottofy, of Chicago, was made secretary *pro tem*.

The following faculties were represented:

*Baltimore College of Dental Surgery.*—B. Holly Smith.

*Boston Dental College.*—J. A. Follett.



*Chicago College of Dental Surgery.*—T. W. Brophy.  
*Harvard University, Dental Department.*—Thomas Fillebrown.  
*Kansas City Dental College.*—J. D. Patterson.  
*Missouri Dental College.*—A. H. Fuller.  
*New York College of Dentistry.*—Frank Abbott.  
*Ohio College of Dental Surgery.*—H. A. Smith.  
*Pennsylvania College of Dental Surgery.*—C. N. Peirce.  
*Philadelphia Dental College.*—S. H. Guilford.  
*State University of Iowa, Dental Department.*—W. O. Kulp.  
*University of Michigan, Dental Department.*—J. Taft.  
*University of Pennsylvania, Dental Department.*—James Truman.  
*Vanderbilt University, Dental Department.*—H. W. Morgan.  
*Louisville College of Dentistry.*—F. Peabody.  
*Southern Medical College, Dental Department.*—C. V. Rbaser.  
*University of Tennessee, Dental Department.*—J. P. Gray.  
*University of Maryland, Dental Department.*—F. J. S. Gorgas.  
*Royal College of Dental Surgeons of Ontario.*—J. B. Willmott.  
*Columbian University, Dental Department.*—H. C. Thompson.  
*Northwestern University Dental School.*—G. H. Cushing.  
*American College of Dental Surgery.*—Louis Ottogy.  
*National University, Dental Department.*—J. Roland Walton.  
*College of Dentistry, University of Minnesota.*—T. E. Weeks.  
 The following schools were admitted to membership during the

meeting:

*Western Reserve University, Dental Department, Cleveland, O.*—  
 H. L. Ambler.

*Western Dental College, Kansas City, Mo.*—D. J. McMillen.

With reference to the application of Howard University, Dental Department, the Executive Committee recommended that in consequence of changes in and inadequacy of its dental department the application be rejected. The report was adopted.

The report of the Executive Committee recommending the admission of the University of Buffalo, Dental Department, to membership, was amended by the addition of the following clause, and then adopted: "When the honorary degrees conferred on Messrs. Southwick and Howard are returned to the University and revoked, and official notification of such revocation filed with the secretary of this Association."<sup>1</sup>

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<sup>1</sup> The Dental Department of the University of Buffalo complied with these conditions on August 13, 1894, and is therefore admitted into full membership. —LOUIS OTTOFF, *Secretary*.

The amendment to Rule 5 offered by Dr. Hunt last year, making the rule read as follows, was adopted unanimously:

"(5) **STANDING OF UNDERGRADUATES IN MEDICINE.**—Undergraduates of reputable medical colleges, who have regularly completed one full scholastic year, having attended at least seventy-five per cent. of a five-months' term, and passed a satisfactory examination in the studies of the freshman year, may be admitted to the junior grade in colleges of this Association, subject to other rules governing admission to that grade."

The following new applications for membership, with their recommendations, were reported by the Executive Committee:

Dental Department, Cleveland University of Medicine and Surgery, Cleveland, Ohio. Recommended by Drs. J. Taft and J. E. Garretson.

Cincinnati College of Dental Surgery, Cincinnati, Ohio. Recommended by Drs. James Truman, T. W. Brophy, F. J. S. Gorgas, and J. A. Follett.

Birmingham Dental College, Birmingham, Ala. Recommended by Drs. H. W. Morgan and C. V. Rosser.

University College of Medicine, Dental Department, Richmond, Va. Recommended by Drs. F. J. S. Gorgas and H. W. Morgan.

Atlanta Dental College, Atlanta, Ga. Recommended by Dr. H. W. Morgan and the Faculty of the University of Tennessee, Dental Department.

The amendment to By-law 4, which was offered by Dr. Hunt last year, was laid on the table.

The resolution offered last year by Dr. Sudduth, directing the addition of Latin and physics to the entrance examination, was also laid on the table.

The special committee appointed last year to consider the matter of the vote of censure passed upon the Baltimore College of Dental Surgery reported, through its chairman, Dr. C. N. Peirce, recommending that no further action be taken. The report was adopted.

Dr. Louis Ottofy offered a recommendation, which was adopted, that all colleges, members of this Association, shall increase the college course of 1895-96 to not less than six months.

The following resolution from the Executive Committee was adopted:

*Resolved*, That any college or colleges making application for membership in the National Association of Dental Faculties shall be required to secure and present to the Executive Committee the approval and indorsement of the Board of Dental Examiners of the State (where such boards exist) in which such colleges are located, before their application can be considered.

The following from the Executive Committee was laid on the table:

*Resolved*, That we regard it as inconsistent for any member of a Faculty of any college holding membership in this body to at the same time be a member of any State Board of Dental Examiners.

The report of the *ad interim* committee with reference to charges preferred against the University of Maryland, Dental Department, was referred to the Executive Committee, which reported as follows:

"Your Executive Committee respectfully report that they find that the University of Maryland, Dental Department, in the reception of certain students did violate the regulations of this Association through a misapprehension of the rules, as it is interpreted by your committee that the regular sessions of all colleges close with their commencement exercises."

The report was adopted.

Dr. Guilford moved that Rule 11, page 11 of the "History," be understood to mean that students coming from a college not a member of this Association will not be given credit for any time spent in such institution.

The annual dues were increased from three dollars to five dollars on motion of Dr. Cushing, the increase to take effect in 1895-96.

On motion of Dr. Truman, the special Committee on Preliminary Examinations was instructed to have prepared by a competent person and present at the next annual meeting a list of questions of a standard covering every branch required in the grammar schools up to the point of admission to the high schools.

On motion of Dr. Abbott, it was ordered that each college should each year present its announcement, noting any changes, the secretary to note and publish all important changes in the annual report of the Association.

On motion of Dr. Morgan, all the schools were required to comply with the rule regarding dissections.

On motion of Dr. Ottofy, a committee of three was appointed to revise the constitution and by-laws, with the further instruction, on motion of Dr. Truman, to drop the qualifying term "by."

The following were introduced, and under the rules lie over till next year:

By Dr. Peirce:

*Resolved*, That, in view of the recommendation of the Executive Committee, this Association will require that all colleges, members of this Association, shall extend the term of the session of 1896-97, and of succeeding sessions, to not less than seven months each.

By Dr. Truman :

*Resolved*, That on and after the session of 1898-99 the regular session of each of the colleges belonging to this Association shall be extended to four years.

By Dr. Ottofy :

Beginning with the session of 1896-97, the examinations conducted by the colleges of this Association shall be in the English language only.

By Dr. Ottofy :

Beginning with the session of 1895-96, no college shall be permitted to retain membership in this Association if it is conducted or managed, in whole or in part, by any person or persons who do not practise dentistry in accordance with well-recognized and generally accepted forms, generally known as dental ethics, or if they are owned in whole or in part by men or women who are engaged in disreputable dental practice, or if any college have upon its list of trustees, the Faculty, demonstrators, or in any other capacity, any one who does not practise dentistry in accordance with the principles above mentioned. This shall refer to dentists only.

By Dr. Ottofy :

Beginning with the session of 1896-97, the following shall be the requirements for the admission of students to the colleges of this Association :

a. A certificate of having successfully completed at least one full year's course of study in the collegiate department of any college or university registered by the regents of the State of New York as maintaining a satisfactory standard.

b. A certificate of having passed, in a registered institution, examinations equivalent to the full collegiate course of the freshman year, or to a completed three years' academic course.

c. Regents of the State of New York pass cards for any forty-eight counts.

d. A certificate of having passed the matriculation examinations of any university in Great Britain or Ireland, or of having completed a course of study recognized as an equivalent therefor.

e. A certificate of graduation from any registered gymnasium in Germany, Austria, or Russia.

f. A certificate of the successful completion of a course of five years in a registered Italian *ginnasio* and three years in a *liceo*.

g. The bachelor's degree in arts or science, or substantial equivalents, from any registered institution in France or Spain.

h. Any credential from a registered institution, or from the government in any foreign state or country, which represents the completion of a course of studies equivalent to graduation from a registered New York high school, academy, or from a registered Prussian gymnasium.

By Dr. Gray :

*Resolved*, That law 7 of the by-laws, which now reads, "attendance upon three full courses of not less than five months each in separate years shall be required before examination for graduation," be amended by substituting "six" instead of "five," to take effect on and after the year 1896-97.

By Dr. Willmott:

*Resolved*, That at least twenty-nine months intervene between the beginning of the freshman year and the date of graduation.

The Committee on Text-Books presented the following report, which was adopted:

Your Committee on Text-Books would report that only two works of this character have been presented for its consideration:

One, a work on "Dental Anatomy and Pathology," by Dr. C. F. W. Bödecker, of New York, seven hundred pages; and the other, a smaller and less pretentious work of about seventy-five pages, on "Operative Techniques," by Dr. Thomas E. Weeks, of Minneapolis.

Both of these works are in press and nearly completed. The treatment of their subjects is full, clear, and concise, and the illustrations numerous, well executed, and for the most part entirely new.

Your committee would therefore recommend these two works for indorsement as text-books.

Suitable resolutions regarding the death of Drs. R. B. Winder and W. H. Eames were presented and adopted, and the secretary was instructed to communicate a copy to their respective families.

The following officers were elected for the ensuing year: Frank Abbott, President; S. H. Guilford, Vice-President; Louis Ottofy, Secretary; H. W. Morgan, Treasurer; J. Taft, B. Holly Smith, and Thomas Fillebrown, Executive Committee; James Truman, Truman W. Brophy, and Francis Peabody, *Ad Interim* Committee.

Dr. Abbott, the newly-elected president, was installed, and appointed the following committees:

*Committee on Schools*.—J. A. Follett, F. J. S. Gorgas, Louis Ottofy, C. N. Peirce, and Truman W. Brophy.

*Committee on Text-Books*.—J. D. Patterson, A. O. Hunt, J. B. Willmott, T. E. Weeks, and J. P. Gray.

Adjourned.

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## AMERICAN DENTAL SOCIETY OF EUROPE.

THE nineteenth meeting of this Society was held at Geneva, August 6 to 8. Dr. Royce, of Tunbridge Wells, England, reported experiments made upon puppies of two weeks old to test the effect of the direct action of mercury upon the formation of enamel. He advanced the theory that the defects ascribed by Hutchinson to hereditary syphilis may rather be attributed to hereditary mercu-

rialization. His experiments in this direction are not yet complete, but will be awaited with interest.

Papers were also presented by Professor W. D. Miller, of Berlin, Dr. Luce, of Stuttgart, and others, and Professors Eternod and Vulliet, of Geneva University, gave interesting demonstrations, the former on the "Law of Statics in Hard and Soft Dental Tissues," the latter on "Dermoid Growths," which were followed with great interest by all the members.

The following officers were chosen for the year 1894-95: President, Dr. Chas. W. Jenkins, Zürich; Vice-President, Dr. Wm. Mitchell, London; Treasurer, Dr. Chas. J. Monk, Wiesbaden; Secretary, Dr. Wm. S. Davenport, Paris.

The next meeting will be held at Boulogne, France.

WM. S. DAVENPORT,  
*Secretary.*

#### NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE Thirteenth Annual Meeting of the National Association of Dental Examiners was held at Old Point Comfort, Va., beginning Tuesday, August 7, 1894, Dr. J. Searle Hurlbut presiding. In the absence of the secretary, Dr. C. A. Meeker was appointed secretary *pro tem*.

The following State Boards were represented :

*Alabama*.—T. P. Whitby.

*Delaware*.—D. M. Hitch, C. R. Jefferis.

*District of Columbia*.—H. B. Noble, Wms. Donnally.

*Georgia*.—B. H. Catching.

*Illinois*.—L. L. Davis.

*Iowa*.—J. T. Abbott.

*Kansas*.—L. C. Wasson.

*Kentucky*.—C. G. Edwards.

*Massachusetts*.—J. Searle Hurlbut.

*New Jersey*.—F. C. Barlow, Charles A. Meeker.

*North Carolina*.—V. E. Turner.

*Pennsylvania*.—W. E. Magill, Louis Jack, L. Ashley Faught.

*Tennessee*.—J. Y. Crawford.

*Virginia*.—J. Hall Moore, E. P. Beadles.

The secretary read a communication from the Board of Examiners of the State of Minnesota, insisting that their resignation, tendered in 1892, should be accepted. On motion of Dr. C. G. Edwards, the resignation was accepted.

An application for membership from the Board of Examiners of the State of Oregon was received, and the secretary instructed to answer the same.

On motion of Dr. F. C. Barlow, the secretary was instructed to have the constitution, by-laws, and standing resolutions to date printed in pamphlet form and sent to all members of the Association.

On motion of Dr. Louis Jack, the secretary was instructed to have the proceedings of the Association at its meetings of 1893-94 printed in one pamphlet.

The secretary read a memorial from the Examining Boards of New York, New Jersey, Delaware, Rhode Island, Connecticut, Pennsylvania, and the District of Columbia, regarding the necessity of uniformity in standards of examinations in different States, which, with the following resolution on the same subject laid over last year, was referred to a committee consisting of Drs. Faught, Crawford, and Catching:

*Resolved*, That it is the sense of the National Association of Dental Examiners, that when a member of the dental profession presents a certificate of registration from a State Board of Dental Examiners, duly created by law, that the same should entitle the holder of such certificate to registration without an additional examination in any State of the Union having a law to regulate the practice of dentistry. *Provided*, such certificate was obtained on examination.

The committee subsequently reported, recommending the adoption of the memorial as expressing the sense of the Association.

The report was adopted, a verbal amendment to the memorial offered by Dr. Donnally being accepted, making it read as follows:

TO THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS:

GENTLEMEN,—Delegates from the Examining Boards of New York, New Jersey, Delaware, Rhode Island, District of Columbia, Pennsylvania, and Connecticut, in conference assembled, respectfully offer for your consideration the opinion that ours is an advancing profession, our watchword is progress, and we ask that your influence shall be actively directed to secure thorough preliminary examinations in every dental college in every State.

We think the true interests of our profession demand such uniformity in standards of examinations as can be obtained by State Boards always striving after higher and better attainments, and with a view to ultimately bring about a safe, judicious, and fair reception of certificates from State Boards of other States.

It is our opinion that it would be most desirable that a law whose provisions should be uniform, yet whose phraseology might be different, so as to suit differences of environment in the various States, should be enacted in all the States. It is not practicable to have any such law enacted in all the States at once; but if such a law were enacted in half a dozen leading States, other States would gradually fall into line and adopt similar ones.

We are in favor of bringing responsibility for defective education as directly as possible upon the offending school, with a view to making every diploma real and reliable evidence as regards the holder's ability and proficiency. Therefore we will use our influence as practitioners, as well as members of examining boards, to obtain the selection, by competent authority, in each State, of an independent body, disconnected from the institutions which educate, with sole authority to grant licenses and admit to practice.

G. CARLETON BROWN,

Secretary.

The Committee on Colleges reported that there were now twenty-eight recognized and fifteen unrecognized colleges; that there have been no addition to the accepted schools.

The chairman, Dr. Jack, read the following report of the number of matriculates and graduates at the different schools:

RECOGNIZED SCHOOLS.—1894.	Freshmen.	Juniors.	Seniors.	Graduates.	Post-Graduates.
1. Baltimore College of Dental Surgery, Md. . . . .	47	45	40	37	. .
2. Boston Dental College, Mass. . . . .	55	55	35	33	. .
3. Chicago College of Dental Surgery, Ill. . . . .	127	116	69	58	28
4. College of Dentistry, Department of Medicine, University of Minnesota . . . . .	23	12	6	6	. .
5. Dental Department Columbian University, D. C. . . . .	12	19	8	8	1
6. Dental Department National University, D.C. . . . .	6	9	8	8	. .
7. Northwestern University Dental School, Ill. . . . .	33	36	25	24	6
8. Dental Department Southern Medical College, Ga. . . . .	19	4	4	4	. .
9. Dental Department University of Tennessee . . . . .	16	12	12	10	. .
10. Dental Department Harvard University, Mass. . . . .	31	14	18	14	. .
11. Indiana Dental College, Ind. . . . .	29	32	23	23	. .
12. Kansas City Dental College, Mo. . . . .	54	36	18	16	. .
13. Louisville College of Dentistry, Ky. . . . .	54	27	10	9	. .
14. Missouri Dental College . . . . .	41	31	21	21	. .
15. New York College of Dentistry . . . . .	111	92	81	62	1
16. Northwestern College of Dental Surgery, Ill. . . . .	32	36	25	24	. .
17. Ohio College of Dental Surgery . . . . .	57	57	34	34	. .
18. Pennsylvania College of Dental Surgery . . . . .	100	80	63	62	. .
19. Philadelphia Dental College . . . . .	93	107	78	77	. .
20. School of Dentistry of Meharry Medical De- partment of Central Tennessee College . . . . .	4	8	3	3	. .
21. Dental Department University of California . . . . .	68	45	18	18	. .
22. Dental Department University of Iowa . . . . .	70	39	32	31	1
23. University of Maryland, Dental Department . . . . .	58	54	36	34	2
24. University of Michigan, Dental Department . . . . .	67	52	66	64	1
25. University of Pennsylvania, Dental Depart- ment . . . . .	81	72	65	64	3
26. Vanderbilt University, Tenn. . . . .	55	44	25	25	. .
27. Western Dental College, Mo. . . . .	42	36	27	26	. .
28. American College of Dental Surgery, Ill. . . . .	128	71	51	44	77



UNRECOGNIZED SCHOOLS.	Freshmen.	Juniors.	Seniors.	Graduates.	Post-Graduates.
University of Denver, Dental Department . . . . .	9	4	8	8	..
University of Buffalo, Dental Department . . . . .	88	82	6	6	..
Cincinnati College of Dental Surgery . . . . .	5	3	5	5	..
Atlanta Dental College . . . . .	61	81	26	26	8
Howard University, Dental Department . . . . .	6	6	5	..	..
Dental Department Homœopathic Hospital College . . . . .	12	7	4	4	..
Western Reserve University, Dental Department . . . . .	9	15	4	4	..
Cincinnati College of Medicine and Surgery, Dental Department* . . . . .	..	..	..	..	..
Detroit College of Medicine, Department of Dentistry . . . . .	16	21	1	1	..
University College of Medicine, Department of Dentistry, Richmond, Va.* . . . .	..	..	..	..	..
The New York Dental School* . . . . .	..	..	..	..	..
Birmingham Dental College, Alabama . . . . .	17	7	8	8	..
Marion Sims College of Medicine, Dental Department, St. Louis (first session, September 11, 1894)* . . . . .	..	..	..	..	..
Dental Department, Tennessee Medical College* . . . . .	..	..	..	..	..
United States Dental College, Chicago* . . . . .	..	..	..	..	..

\* No report.

On motion of Dr. Meeker, the following was adopted :

*Resolved*, That any State Board not represented by delegates at three successive meetings of this body should forfeit its membership.

On motion of Dr. Louis Jack, the following was adopted :

*Resolved*, That this body require the Board of Examiners in each State to become informed of the character of any school which may have been organized within its jurisdiction, and to have especial care in its scrutiny of any college which may have applied for admission to the National Association of Dental Faculties.

The following were elected officers for the ensuing year :

President, L. Ashley Faught; Vice President, J. T. Abbott; Secretary and Treasurer, Charles A. Meeker.

After which the Association adjourned to meet at the time and place appointed for the next annual meeting of the American Dental Association, this body to convene at 10 A.M. on the day preceding the date set for the meeting of the American Dental Association.

## Editorial.

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### ARE WE DEGENERATING?

THE professional wail that dentistry in America is losing ground, and is no better and probably not as far advanced as it was forty years ago, has been sounded in two conventions the past mid-summer,—the Section of Oral and Dental Surgery, American Medical Association, and the Mid-winter Fair Dental Congress, both meeting in California.

While we are in general sympathy with the trend of the remarks made there, and must regard with favor every effort to infuse more activity into the work of our profession, we cannot endorse the wholesale denunciation there made, or the hypercriticism that seemed to prevail in much of the discussion. If these could be sustained upon a careful analysis of the work performed in the past forty years, it might be proper to write degenerated on our outposts for all the outside world to accept as the estimate we place upon ourselves.

There is such a thing as leading without destroying; infusing higher ambitions without undermining the foundations on which a superstructure has been built; but this seems to have been mainly lost sight of in the consideration of the question.

It is unfortunately too true that much that has been written for conventions and journals is a "rehash" of old work, and that many of the papers are the preparation of a day, or a week, and have no real value except they serve to give temporary notoriety to the individuals preparing them. It is also equally true that science does not deal in such material, but endeavors to seek truth at the fountain-head by laborious experiments and, it may be, years of investigation. While this is admitted as true of dentistry in America, as it is of dentistry everywhere, it is equally so of all other professions.

"If we wish our profession to stand high, . . . we should follow the lead of the regular medical profession." This was the counsel given by one of the essayists, and he, doubtless, honestly believed it to be the only course to pursue. It is true that the few in medicine have struggled through the centuries to make it a scientific profession, and have accomplished much in that direction, but it is lamentably the fact that in its practice it falls very far short of that

scientific exactness that dentistry has secured in its half-century of work. In fact, we think it can be truthfully said that whatever of science has been secured to medicine has been accomplished by specialists. How many years has it been since specialism in the profession of medicine was regarded with extreme disfavor? Twenty-five years ago the man who dared to step beyond the general practice was regarded with almost the contempt that was vouchsafed to the dentist of the period. All this is now changed, and the specialist has become the leader, the scientist of the medical profession, the one, in fact, to whom the general practitioner must look up to for guidance. Dentistry led, by force of circumstances, the line of special workers. Its claims were treated with derision, and its efforts to broaden culture as the vain attempts of a race of mechanics to bring their work up to a professional standard.

For one hundred and fifty years, and more, perhaps, the French, English, and subsequently the American dentists have labored incessantly to build a profession on scientific principles. At no period in all that time have the representative men in dentistry failed in their duty. Every step has been laboriously won, and but for this faithfulness those who so seriously attacked its worth in the California conventions would not have been able to attend there as delegates, nor would these meetings have been a possibility. The work has been unceasing and not confined to any one country; each of the civilized nationalities has had an honorable share in the labor. We are not disposed to overestimate the part taken by America in this advance, but it has added no inconsiderable portion to the scientific wealth of the world's dental knowledge.

It is in bad taste, in our opinion, to single out a large body of men for special denunciation, and to enforce this by comparing the results obtained with the work of other people. We question the truth of the statement that "our transatlantic *confrères* produce an aggregate of scientific work in dentistry which far exceeds the output in this country." In a somewhat extended acquaintance with foreign dental literature we have failed to discover the correctness of this, but there has been recognized a painstaking effort in contributions to give, what may be truthfully said to be rare in the United States, full quotations and due credit for previous discoveries in the same line of work.

It is unfortunately too true that the laborious scientist in this country has had in the past no recognition. The egotistic assumption of the arrogant German, quoted at the meeting, that an im-

portant discovery in medicine by an American had been overlooked because "medical science (in America) had *been regarded as still in its kinderschule*," illustrates exactly how difficult it has been for an American to make an impression. We have no desire to be personal in this article, but it may be said with truth that had the distinguished discoverer of the cause of dental caries produced the same result in America, he would not have had an audience; but, having been fortunately located in Germany, he had the entire world to recognize the correctness of his claims and the thoroughness of his investigation.

It is discreditable to this country that this should be. It is a time for self-assertion, and not self-depreciation. The assumptions derogatory to the work performed here, prevalent in this country and abroad, should be met with a dignified spirit of denial. We are not prepared to believe it does exist to any extent in foreign countries, but it would not be surprising if it became the general opinion, if many more such convocations discussed the subject as was done in California.

True science can never have many close followers in any profession. It means a self-sacrificing life; comparative poverty follows in its train, and the only hope of reward must be found in the pleasure of the work and the consciousness that truth has been exalted by the efforts. Such unselfishness must always be rare.

Dentistry is peculiar in that the individual must be remarkably constituted to be able to devote himself to scientific work and make money by his profession. The two things do not harmonize. Hence the number of scientists in it must be limited, for the practice is too exhausting to admit of extended devotion to it and laborious investigation in untrodden fields. This is also largely true of medicine, hence we find in that profession that those who devote themselves to original work are rarely practitioners in the accepted sense.

Dentistry has accomplished a great work in a half-century. In some things the advance has been of a most brilliant character, and along all lines the higher education prevailing in all our best schools is sending out men who will not always be practitioners in the moneyed sense, but who will make a name on the roll of fame worthy to stand with any of the world's people. It stands to-day equal to any of the specialties of medicine, and this has been accomplished by a steady and persistent advance in scientific work. While we may wish for better things in the future, let us not deprecate the good accomplished, or lessen our self-respect by unjust comparisons.

## Bibliography.

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**A MANUAL OF DENTAL ANATOMY, HUMAN AND COMPARATIVE.** By Charles S. Tomes, M.A., F.R.S., with two hundred and thirty-five Illustrations. Fourth Edition. P. Blakiston, Son & Co., Philadelphia, 1894.

The student of comparative anatomy has now the way made very easy for him as compared with that of the one struggling with the subject thirty years ago. Then expensive works or tedious search in libraries, in addition to extended personal investigation, were required to meet the demands of special training.

This was, perhaps, not a matter for regret, as it forced the dental student to a direct examination of tooth-forms, and in this way accomplishing a more thorough comprehension of dental anatomy than could be obtained from books. Yet these cannot be dispensed with, and the student of to-day should feel grateful to the author and publisher of this volume that it is made possible for him, at this period, to add to his library at moderate cost the substance of Owen's great work and the researches in comparative dental anatomy brought up to date.

In the preface to this fourth edition the author very modestly says, "It has been my endeavor to give an outline of the more important facts of odontology, such as may serve as an introduction to a more extended study of the subject." This hardly does justice to this work. It covers all essentials so thoroughly that the dental student has no cause to look further, as far as books are concerned. It, however, remains true, that books, no matter how ably prepared, should not take the place of personal and direct investigation.

Chapters I. to VIII. include the consideration of The Nature of Teeth, Dental Tissues, Development of Teeth, Attachment, etc. The author has been very successful in explaining all the processes of tooth-formation, and that with admirable clearness. He has avoided the temptation of most authors of overloading with technical terms, and where these are used they are explained in a way to relieve the subject of all difficulty.

On examination of the pages devoted to the histology of structure, one is impressed with the fact that for years very little,

perhaps nothing, has been added to our knowledge of the hard tissues of the teeth. There has been much work in this direction, but the new points evolved, while possibly true, still require confirmation. We are no further advanced in the study of the sensitiveness of dentine and the function of the fibril than we were when John Tomes, the discoverer, explained their presence in the tubuli of dentine. It is true we know more of the contents of these tubes, and are familiar with the appearance of "Neumann's sheaths," and have a clearer idea of the inner tubular contents, but exactly how sensation is conveyed is not explained, for, as the author says, "no true nerve-fibril has yet been proved to enter the dentine."

The chapter on "Development of Teeth" is made very plain. It is a difficult subject to clearly describe on paper, but the author, by following development from the teeth of fishes to those of mammalia, renders the subject easy of comprehension to the student. He has enriched his pages by the most recent researches, while not omitting those which, as he says, "might be regarded as classical."

Beginning with Chapter IX., page 219, the author describes the typical forms of the fishes, reptiles, birds, and mammals. There is, therefore, compressed in this "Manual of Dental Anatomy" all the essentials to the study of this branch of comparative anatomy, bringing this important subject within the reach of every one at a moderate cost.

As it is equally necessary for the practitioner to have a book of ready reference, as well as the student one for study, this volume, the work of Charles S. Tomes, can be recommended, without any reservations, as the most complete of its kind now available, and should be placed upon the list of text-books of all colleges and in dental libraries.

A TREATISE ON PYORRHOEA ALVEOLARIS: A SYSTEM FOR ITS PROMPT, POSITIVE, AND PERMANENT CURE. By Junius E. Cravens, D.D.S. W. M. Herriott, Publisher, Indianapolis, Ind.

This monograph, of forty-eight pages, gives the author's ideas of pyorrhœa alveolaris, but does not add materially to our comprehension of this pathological condition. This does not seem to have been his intention in writing the book, but rather to give his mode of treatment.

His general proposition, "that wherever a tooth retains good attachment upon one or more sides of its root it may safely be classed as curable," possibly cannot be controverted; but it does

not necessarily follow that those suffering from greater destruction cannot be restored to health.

The origin of calculus, according to the author's belief, may be ascribed to the constant bathing of pus, and he is doubtless correct, as the proportion of lime-salts in pus greatly exceeds that in saliva.

There is no reasonable cause given for the destruction of the pericementum, beyond the deposition of calculus, for, he says, "As a result of continued periostitis the wall of the socket is gradually destroyed. . . . Just how the pericementum may be affected . . . is not definitely known."

Pus-pockets are at times connected with "galleries" and "grottoes;" the latter are excavations between the roots of molars.

The treatment consists of, first, repeated douches of hot water, heated at 140° F. The part is next subjected to an anæsthetic, cocaine preferred. The root is then scraped with a scaler, to remove all deposits. The case is then treated with a ten-per-cent. solution of nitrate of silver, followed by an astringent, chloride of aluminum, or, preferably, *bromo-chloralum*.

No allusion to systemic conditions is made by the author, and it is presumed he regards pyorrhœa alveolaris as of purely local origin.

**A MODERN WIZARD.** By Rodrigues Ottolengui, author of "Artist in Crime," etc. G. D. Putnam's Sons, New York, 1894. For sale by J. B. Lippincott Company, Philadelphia.

Novels, ordinarily, are not the character of books suitable for review in a professional journal, but the above title represents not only the work of a prominent dentist, but contains within it matter very suggestive to the thinker along legal, medical, and psychical lines.

The book opens with the trial of a certain Dr. Medjora, charged with poisoning his wife with morphine. The complication was that she was affected at the same time with diphtheria. The case as presented in its legal aspects is, to the layman's mind, skilfully worked out, ending in the acquittal of the doctor.

The point which the author evidently wishes to be impressed on the reader is the possibility of microbic cultures of contagious diseases being used to destroy life, and thus evade the keenest search of the chemical expert.

The plot is also made to bring into play various psychic powers, some recognized and others still to be proved. Hypnotism plays a prominent part, but the author carries this beyond what is believed

to be its legitimate possibilities, and thus creates what must be regarded as a wrong impression. Hypnosis has its limit. Its production in the most susceptible person is usually slow, and the deeper manifestations are not produced at once upon an untrained subject.

The book is written in the author's attractive style, and maintains the interest from the beginning to the end. It is questionable whether he succeeds in drawing his characters very distinctively. Character-building, such as Dickens pre-eminently possessed, can be attained by few. The author makes the boy Leon, fresh from the country and but poorly educated, talk as learnedly as the profound doctor, and the young Agnes follows in the same strain. This is doubtless essential to a proper discussion of certain problems of philosophical thought, but it detracts in a measure from the artistic finish of the production.

The book belongs to the class of which Balzac was the earlier and Marie Corelli the latter representative. They all carry psychic problems to an extreme. In this case the developments in bacteriology are extended beyond the expectations of the most sanguine, and in a very unpleasant way, and yet the possibilities, it would seem, are not over stated.

The book can be read with interest by professional men generally.

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## Obituary.

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### DR. RANSOM WALKER.

DIED at Owego, N. Y., July 31, 1894, of apoplexy, Ransom Walker, D.D.S., in the seventy-sixth year of his age.

Dr. Walker was born in Greene, Chenango County, N. Y., October 23, 1818. He received his early education in the public schools of his native town and at Cortland Academy at Homer, N. Y.

As he approached early manhood he felt impelled to enter the Christian ministry, and his subsequent education was along these lines, but later he abandoned that idea, and entered upon the study of dentistry, being a pupil of the late Amos Wescott, of Syracuse. During the time of his pupilage the New York College



of Dental Surgery was established at Syracuse, at which institution he attended one course of lectures, and the following year removed to Owego, where he began the practice of dentistry. He very soon acquired a large and lucrative practice.

During the winter of 1865-66 he left his practice to attend a course of lectures at the Pennsylvania College of Dental Surgery, from which he graduated in the spring of 1866. He then returned to Owego and resumed his professional work, which he pursued almost uninterruptedly until he was stricken, while at his operating-chair, August 20, 1892. This was followed by another attack, a few days later, which so disabled him that he was compelled to abandon his professional labors. Although he somewhat rallied from these attacks and was able to keep about, he never regained the entire use of his hands. The final stroke came but a few days before his death.

Dr. Walker was a dentist of more than ordinary ability, possessing as he did manipulative skill in an eminent degree.

During the first twenty years of his practice he received into his office as pupils many young men, and he was regarded as a faithful and conscientious preceptor. Among those who received their early training at his hands were O. E. Hill, of Brooklyn; Edwin T. Darby, of Philadelphia; Charles H. Darby, of St. Joseph, Mo.; and Frank B. Darby, of Elmira, N. Y. Dr. Walker was among the first to improve the character of dental amalgams, and after years of experimentation he put upon the market, in 1866, an alloy composed of gold, silver, platinum, and tin, which was known as Walker's excelsior amalgam. When a good man dies it is but fitting that we make mention of his worth, and Dr. Walker was a good man. He inherited from his ancestry a good constitution and a good name, but not riches; but by industry, honesty, and prudence he attained a competency.

The sense of justice was never more marked in any man than in him. His moral and religious character was above reproach. He was a true friend, a loving husband, a public-spirited citizen, a Christian gentleman. As I pen these memorial lines of my departed preceptor and friend I pause to hang upon his tombstone a garland rich in appreciation of kindness received at his hands.

Dr. Walker was married to Mary Snider, of Virgil, N. Y., September 3, 1845. She still survives him.

EDWIN T. DARBY.

## Current News.

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### NEW ENGLAND DENTAL SOCIETY.

THE Thirty-second Annual Meeting of the New England Dental Society will be held in Hotel Clarendon, Tremont Street, Boston, Mass., Thursday and Friday, November 8 and 9, 1894, beginning Thursday afternoon at one o'clock. Please mark off the days on your appointment book *now*, and make an earnest effort to be present, as the meeting promises to be of unusual interest. A dinner is proposed with a light entertainment, Thursday, at 6.30 P.M. Programmes will be sent later.

Per order of the Executive Committee,

EDGAR O. KINSMAN, D.D.S.,

*Secretary.*

15 BRATTLE STREET, CAMBRIDGE, MASS.,

September 15, 1894.

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### RECENT PATENTS.

A LIST of recent patents reported specially for the INTERNATIONAL DENTAL JOURNAL:

521,930.—Dental Plate. Thomas H. Graham, Toronto, Canada. Filed April 6, 1894. Patented in Canada.

522,188.—Dental Articulator. George K. Bagby, Newberne, N. C. Filed April 23, 1894.

522,192.—Head-Rest. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed February 13, 1893.

522,211.—Dental Abrading or Cutting Tool. Woodbury S. How, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed August 16, 1893.

522,212.—Dental Bite-Plate. Woodbury S. How, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed April 16, 1894.

522,291.—Angle Attachment for Dental Engines. Charles H. Davis, Worcester, Mass. Filed April 18, 1893.

522,309.—Dental Apparatus. William Wright, Boston, Mass., assignor of one-half to Granville O. Avery, same place. Filed April 17, 1894.

522,400.—Artificial Tooth. Edward Bowlus, Frederick, Md. Filed March 23, 1894.

522,552.—Adjustable Bracket for Dental Engines. Arthur W. Browne, Prince's Bay, New York, assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed December 26, 1893.

522,563.—Head-Rest. William E. Hunt, Detroit, Mich. Filed June 15, 1892.

522,922.—Dental Chair. Dewell Stuck, Rochester, N. Y. Filed October 18, 1893.

Trade-Marks.—24,940.—Dental Gold-Foil. The S. S. White Dental Manufacturing Company, Philadelphia, Pa., New York and Brooklyn, N. Y., Boston, Mass., Chicago, Ill., and Atlanta, Ga. Filed November 13, 1893. Essential Feature the representation of a globe bearing a band on which are the words "Globe Gold-Foil."

24,941.—Dental Gum or Rubber. The S. S. White Dental Manufacturing Company, Philadelphia, Pa., New York and Brooklyn, N. Y., Boston, Mass., Chicago, Ill., and Atlanta, Ga. Filed November 13, 1893. Essential feature the words "Bow-Spring Rubber."

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## UNION DENTAL CONVENTION.

THE Twenty-sixth Union Dental Convention, of the Fifth, Sixth, Seventh, and Eighth District Dental Societies of the State of New York, will be held in the City of Buffalo, New York, October 30 and 31. A meeting of more than usual interest is expected.

D. H. SQUIRE,  
*Secretary.*

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## Selections.

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### GUAIACOL.

At a recent meeting of the Paris Society of Biology, a report of which we find in the *Union Médicale* for November 30, M. Gilbert and M. L. Maurat presented a communication in which it was remarked that guaiacol was one of the derivatives of creosote that had been most experimented with. The liquid guaiacol found in commerce, the authors went on to say, meaning the guaiacol ob-

tained from creosote, was far from being almost a chemically pure product. It was a mixture of cresylol, guaiacol, and creosote in varying proportions; it might contain fifty per cent. of guaiacol, but sometimes it contained no more than twenty or even ten per cent. Pure guaiacol occurred in the form of hard, white rhomboidal crystals, almost insoluble in water, but soluble in alcohol, in oil, and in anhydrous glycerin. The taste of guaiacol is slightly sugary, with a pungent and burning after-taste. Pure guaiacol has been prepared synthetically by Behel and Chouy, and it was this product that the authors had used in their experiments. The amount of guaiacol, dissolved in glycerin or olive oil, necessary to kill a guinea-pig weighing a kilogramme is between five and fifteen grains, given hypodermically; it takes twenty-three grains given by the mouth to produce the same result. With a liquid guaiacol obtained from Germany, containing forty-six per cent. of guaiacol, 3.6 per cent of cresylol, and 50.5 per cent. of cresol and homocresol, from fifteen to twenty grains were found necessary to kill a guinea-pig weighing a kilogramme. This product, therefore, is less poisonous than pure guaiacol, but it contains less than half of the active principle. The chief effects of poisoning with guaiacol are agitation and then enfeeblement with retardation of the heart's action and of the breathing. Most of the secretions are increased in quantity, especially the lachrymal secretion. At the moment of death, which occurs during coma, the thermometer may fall as low as 68° F. [*jusqu'à 20°*]. The biological effects of liquid guaiacol resemble those of solid guaiacol, but the reduction of temperature and the increase of the secretions are less pronounced. The authors have used synthetic guaiacol for several months in a certain number of cases of consumption in various stages. They have given it in daily quantities of from six to eighteen grains, in the form of pearls, each containing three grains of the active principle in oily solution. As a general thing, the stomach bears the drug well if it is taken immediately before eating. Sometimes large doses cause vomiting, but this may be avoided easily by testing the patient's susceptibility by administering progressively increasing doses of the synthetic preparation.—*New York Medical Journal*.

# THE International Dental Journal.

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No. 11.

## Original Communications.<sup>1</sup>

### TECHNIQUE OF CONSERVATIVE PULP-TREATMENT.<sup>2</sup>

BY LOUIS JACK, D.D.S., PHILADELPHIA.

GENTLEMEN,—My lecture before you this evening is upon a subject which, to students, must be of considerable interest. It is the more agreeable to consider this operation before you for the reason that it gives the opportunity to deal with the most minute details of treatment. It is presumed that the least minutiae in the management of the exposed pulp, and of the considerations connected with the treatment thereof, will not fail of receiving your attention. Whatever previous instruction you may have had in this field, you must welcome varying light upon every feature of the treatment.

The preservation of the vitality of the exposed dental pulp has from an early period in the history of dentistry been a desideratum,—first, as a means of securing the avoidance of pain, and, secondly, because the devitalized tooth becomes of less value, for the reasons that its appearance is impaired, its cohesion is gradually lessened until at length it is lost by fracture, and in many instances

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<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

<sup>2</sup> A lecture delivered before the class at the Department of Dentistry, University of Pennsylvania.

the abnormal condition arouses disturbance of the surrounding parts.

The views held upon the probability of success in the conservative treatment of the pulp, it must be admitted, are at the present time in a very discordant state. As you may have observed, some claim a very large percentage of successful results, and others denounce any attempt at such treatment. How are we to reconcile these counter views, held in each case by intelligent and conscientious men. The causes of this disparity of opinion will appear at least by inference as the consideration of the general subject advances; only this may be stated here, that either the treatment has not been conducted with the required carefulness or the attempts have been made upon cases where this treatment was not applicable. The differences in the conditions of various exposed pulps are as great as that between simple and compound fractures of the bones, in the latter of which the prognosis is in general doubtful; and I shall attempt to define the distinction between salvable pulps and those doomed to inevitable loss, and thus to present to you some lines upon which to establish the prognosis of any given class of cases.

At the very outset let me state to you that, while the treatment of the pulp in this manner is not difficult, it is one of the most delicate operations in dentistry, requiring the truest hand, the lightest touch, the greatest patience, and the utmost consideration for the sensibility of the patient. Furthermore, it necessitates a careful observation of all the symptoms and presented conditions, with a rational analysis of these. He who has the physical and the mental qualifications need not fear to enter this field if he will keep within the limitations governing success.

There are several general propositions in reference to the pulp necessary to be kept in view as guiding principles. These are:

(a) The pulp of the tooth in the earlier condition of simple encroachment by caries is not a very sensitive organ, as it permits the approach of the carious action without in the majority of instances indicating by the presence of pain that it has been invaded, and it tolerates in this condition light instrumental contact with but little indication of pain.

(b) It is more impatient of compression than of any other form of irritation.

(c) It is intolerant of drugs, and accepts only the milder kinds of medication, and of such character as to be soluble in water.

(d) In the earlier stages of exposure the elements of the organ involved are its nervous filaments, which are hyperæsthetic from the hyperæmic state of the organ adjacent to the point of exposure.

(e) That at this stage the pulp becomes impatient of cold, and may indicate the encroachment of caries by subjective (reflected) pain in other branches of the trigeminus.

(f) That later on, unless these conditions are subdued by treatment, congestion of the organ takes place, when objective disturbances arise, which indicate that the point of danger has approached. Soon thereafter hopes of successful treatment may vanish.

In a well-regulated practice, where the patients are under frequent observation and have regular and periodic care taken of the teeth, the pulp exposure which takes place should be of the simpler kind, and should be placed under treatment so early after the carious action has affected the pulp that the prospects of successful treatment are not remote.

But when neglected cases appear, the history of which has been obscure, and when the patient is driven for relief by the occurrence of objective symptoms, the prospects of success are of doubtful character. The contrast of these two classes will throw some light upon the frequent absolute failures of attempts to treat the exposed pulp, and accounts for the discredit which has been cast upon conservative treatment.

At the commencement of the treatment to restore the lost tissue in any given carious tooth, except in the obviously very small cavities, the probability of encroachment upon the pulp should be a supposition, and each step should be made with reference to this probability. The destruction of the dentine is frequently surprisingly deep, or the cornua of the pulp often is acutely pointed and may be unexpectedly encountered. Therefore, in what may seem simple cases, cautious approach should be made towards the bottom of the cavity.

The opening of the cavity should be effected by instruments which will not easily enter the cavity, and the softer caries removed in a manner which will not induce pressure of the decayed matter upon the pulp, as once this organ is trampled upon, no after-degree of care will avail to subdue the irritation which is liable to arise. The subsequent irritation caused by active pressure in this manner probably is due to disturbance of the pulp-tissue in its relations, caused by its laceration from the walls of its cell; which may be the consequence of the feeble connection between the pulp and the walls of the chamber.

For the same reason, in the removal of the caries the excavation should be first carried on at the sides of the cavity, and also along the margin of the cervical wall in proximal cases. Then the carious matter nearest the pulp should be carefully peeled off without pressure and without irritation. In this manner a pulp may be uncovered and the cavity cleansed of carious matter without contact being made with the pulp. To do this is the acme of skilful preparation. To uncover the dental pulp without pressure and without making contact with it is more than half the battle, if so peaceful a proceeding can be so designated.

The instruments for removing the caries should be of thin edge, very sharp, and always having cutting surfaces which are rounded, since angular or square-ended excavators are liable to make exposures unnecessarily. It is important that the direction of movement of the excavators should be from the cervix towards the coronal part,—in other words, by drawing cuts instead of pushing cuts. The difference in the excitement of pain between these two methods of cutting is surprising, and can only be appreciated by those who have experienced the comparison upon their own teeth. The probable reason for this is that the force of the pushing cut is necessarily greater. It certainly causes more pain at the moment, and the cleansing in this manner is followed by greater after-irritation. Patients will complain at the time of reflected pain being caused by pushing cuts, and may feel the effects in the trifacial ganglion.

It must be plain to you all that any mode of procedure which increases the local irritation in the preliminary procedure of a pulp treatment must be deleterious to the outcome of the case. Therefore I emphasize the proper direction of the cuts. I would also state that the danger of making unnecessary exposures and of forcing the instruments upon the pulp are greater under push cutting. You will not fail to consider that the insertion of burring instruments in this class of cases would be entirely unadvisable, since the infliction of some compression would be unavoidable.

Now, an interesting question appears. A cavity may be sufficiently deep to cause an exposure; it is carefully cleansed, and the cornua of the pulp is not observed. There may have been evidences of irritation. How shall we determine whether there is a real but minute exposure, or whether there is a safe amount of tissue to protect the pulp beneath the stopping-material?

I would state here, somewhat out of place, that I consider it better in all cases to remove all soft caries, feeling it the safest side



on which to choose, than to introduce a filling over the ultimate layer of decay with the hope that after all the pulp may not be actually reached and that the last layer of decay may serve, when disinfected, as a better non-conductor than some foreign substance. This opposite view has caused me grief on many occasions, and will cause you to fall into the same pit if you will allow yourselves to be deluded by it. Therefore, I advise you to remove the soft caries, stopping the excavation when the tissue begins to have a reasonable degree of consistence. Only experience will give you the facility to determine the safe line.

Going back again, how shall we be sure the pulp is not exposed, in case it does not appear to the vision to be so? One method is to cross-hatch the cavity by a very fine explorer; this is done by holding the instrument very lightly and skimming it over the surface in close parallel lines in two directions. If exposed, the instrument at the point of encroachment will lose its resistance or will drag the point of the cornua, as the case may be.

Again, while there may be no visual evidence of exposure, the certainty of it may be shown during the preparation or the testing by a peculiar expression of the face of the patient, different from that manifested by the cutting of the most exquisitely sensitive dentine. This change of the countenance, accompanied with a slight start of the features, may occur without the recognition of pain. I am unable to give you language to describe it better. This indication sometimes appears before nearly all the caries is removed, and is probably caused by some dragging of the apex of the cornua in the disturbance of the carious dentine.

There is still another test of exposure which may be applied in doubtful cases, and which may often be used to determine the probability of exposure before the treatment has commenced. This is of assistance when the cause of reflected pain is occult, and where we have to determine whether the pain, amounting almost to a tic, is caused by a disturbed pulp, or is brought on by malarial influence or a visitation of gouty neuralgia.

I have already called your attention to the influence of cold upon the tooth in a hyperæsthetic state of the pulp. The test by cold is of the greatest importance in the diagnosis. The impatience of the tooth to cold in the earlier disorder of the pulp is an aggravation of what Dr. Black has called the temperature sense of the teeth. This sense of the teeth to cold I may state to you is very various in different individuals; some being able to drink the coldest water and to craunch ice with impunity, while others whose teeth

are sound are impatient of the application of ordinarily cold water if applied directly to the teeth.

This irritability of the teeth, whether it appears naturally or in an aggravated form, is conveyed through the enamel, and in the latter case is a positive sign of disturbance not to be mistaken. By means of it the earliest stages of pulp-disturbance may be determined by isolating the suspected tooth by passing it through a piece of rubber. If carious, the cavity should be temporarily closed with varnished cotton when cold water is applied to the enamel. In making this test the adjacent sound teeth should be tested to attain a comparative result. This is necessary, because of the varying degree of normal sensibility of different persons. The use of this is of value to determine whether any given irritation in doubtful cases is dependent upon the condition of the teeth. If the case is one of malarial or gouty origin, the teeth do not abnormally respond to the cold test. Another diagnostic sign is the occurrence of the pain in the evening. Whereas, neuralgic attacks are more frequent, when dependent upon malaria or gout, in the early hours of the day. We come now to

#### THE IMMEDIATE TREATMENT OF THE UNCOVERED PULP.

When accidental exposure has been made, tincture of calendula, one part to four of water, should be applied as soon as bleeding has ceased. The pulp should then be immediately dressed and capped in the manner to be described later. If only a slight injury has been inflicted, the cavity may be filled at once with metal, having regard to the strength, the placement, and the fixation of the cap used to defend from compression, as will later be described. Here the fixation of the cap is best made by covering it with a broad mat of gold-foil; after adapting this to the margins one may proceed to complete the filling. In respect to this class of exposures there should be no concern as to the success of the treatment, providing the pulp was in a healthy condition at the time of the accident.

When the pulp has been fully uncovered, as previously described, the cavity should be washed clean with tepid water, securely protected from the fluids of the mouth with rubber dam, dried, and lightly filled with a pledget of lint saturated with a mild disinfectant. From your knowledge of the causes of caries and of the concomitant invasion of the zone of dentine immediately beneath the caries by bacteria and micrococci you will recognize that some means of sterilization must be resorted to. It is necessary in the

treatment of ordinary cavities, hence you will readily perceive how much more it is here required. On account of the impatience of the pulp to medication, we have to be very careful in the selection of the sterilizing agent. There is none with which I am acquainted that is less irritating than hydronaphthol. This should not be stronger than 1 to 300 parts of water. The saturated pledget of cotton may remain in the cavity during the procedures of the preparation of the dressing paste, the selection of the cap, etc.

When these preparations are complete the cavity should be again dried, the drying being finished by a few puffs of warmed air. The point of exposure and the adjacent dentine is now touched with a tent of lint, filled with carbolic acid and oil of cloves, &c. The effect of this is to coagulate to a superficial degree the point of exposure. This practice is largely empirical. It may be avoided in cases where no disturbance has previously existed; but where there are evidences of irritation, it has appeared by my experience to be indispensable.

The first impression made upon the minds of those who have been taught that carbolic acid is an irritant to pulp-tissue is that this proposition would appear to be questionable. On this point I have had much experimental knowledge. In the treatment of earlier cases under the prejudice that carbolic acid was irritating, I employed a weak solution of this agent. The results were not favorable, for the reason that in the dilute form it did not coagulate the surface of the exposed point, and was therefore liable to be absorbed, becoming consequently irritating to the pulp.

Pure, or nearly pure, carbolic acid combined with oil of cloves, as here recommended to you, at once produces slight coagulation of the surface of the organ and appears from the absence of irritation to enter no further into the tissue. You will not fail to observe the sterilizing and anæsthetic value of this combination.

In respect of the sterilization of the dentine, questions may arise in your minds whether this may be sufficient to cover the necessities of the case in this respect. First, whether complete sterilization is thus effected; second, whether the pulp may not already have become so far inoculated by bacteria as to render its normal condition an impossibility; and whether, under these circumstances, attempts of superficial sterilization of the dentine can be of any service.

You will not fail to keep in view that the treatment is confined to cases in which it is evident the pulp-tissue is probably not under much irritation. It is hyperæmic, and consequently in a hyper-

æsthetic state congestion has not occurred, nor does inflammation exist. Therefore, the inference is reasonably certain that after the soft caries is removed we may safely sterilize the surface of the dentine and leave the vital force of the pulp to take care of whatever slight bacterial invasion may have reached that tissue. I assume here that your instruction has included the observed fact that healthy tissues have the power of mastering the invasion of non-pathogenic bacteria.

#### THE CAP.

A prominent feature in conservative treatment of the pulp is the means to protect it from pressure, and because of this necessity the means mostly used have given this mode of treatment the appellation of "capping the pulp." The object of the cap is the avoidance of compression. Various means have been used to accomplish this. A common method has been to cover by a dressing the point of exposure; the bottom of the cavity being then lined with oxychloride of zinc or phosphate of zinc, a coating of gutta-percha varnish being interposed between the dressing and the protective material. As this means is complicated, somewhat uncertain, not applicable in shallow cases, and in those very difficult of access, I have preferred to depend upon a metal cap as being simpler and better under control than the above described method.

This kind of cap not only insures to prevent compression, but serves to contain the dressing, which completely occludes the space between the cap and the pulp. These caps may be made of thin platinum or of gold, the former being preferable. In form they should be circular to meet the generality of cases, and oval to accommodate broad exposures. They are most easily made by punching them out with the round and oval leather punches of the hardware shops upon the end of a block of hard wood. This action gives them sufficient concavity for the purpose. For ordinary purposes they should be quite thin, but when it is considered safe to use gold fillings the cap should be sufficiently thick to resist the force of the packing.

#### THE DRESSING.

It is necessary that the space under the cap should be completely closed, otherwise it would fill with fluid effused from the pulp, which quickly would undergo putrefactive changes resulting in the evolution of gas and consequently of compression of the organ beneath. In the earliest attempts at capping the pulp this became the condition, the only thought then being to protect from the

pressure of the instruments. It was then generally supposed that the pulp underwent projection into the space and became strangulated, but all the indications now point to compression by gases being the cause of the almost immediate disturbance.

The dressing I have found most acceptable is formed by rubbing up oxide of zinc into a paste with carbolic acid and oil of cloves of equal measure. The consistency of this should be such that, while being so plastic that the paste will flow out around the cap when it is gently pressed in position, it will not be so thin as to flow out of the cap when it is held on its edge.

The ingrediency of the dressing is based upon these considerations. The menstruum is antiseptic, and possesses some anæsthetic value. It also remains unchanged within the space, and in time becomes, from the dissipation of the menstruum, somewhat firm in its character. The therapeutic action of the menstruum is mild, and is employed for the reason that it is slowly given up by the oxide of zinc, and, therefore, makes an acceptable dressing.

I would call your attention to the value of the combination of hypophosphite of lime with zinc oxide, &c., with the previously stated menstruum. This I have used in many of my earlier experiments, and have lately returned to it in cases of a less promising character than those considered within the lines of easy treatment.

#### PLACING THE CAP IN POSITION.

Placing the cap in position is a step in the treatment requiring care. It should be assured that it is of sufficient size to pass well beyond the borders of the exposed organ, and in the proximate cavities it should cover the pulp-wall of the cavity without intruding upon the marginal walls. If there is a single exposure it should be round; if two coronæ are exposed, either two caps should be laid or one oval one employed, as may best suit the case. In molars, usually where two points are exposed, two caps are generally best; in the bicuspid one oval one under the same circumstances. The cap should be inserted edgewise in such manner that as it is laid in place the excess of dressing may flow out at the margin towards the operator. This is to prevent undue pressure, and to prevent air being included beneath the dressing, which would prevent complete apposition of the dressing with the pulp.

In cases of easy access the cap may be laid in place with fine-pointed pliers,—notably the Bogue plier; but, in the majority of instances it is preferable to previously coat the convex side of the metal with yellow wax, when, with an instrument adapted to the

case, it may be carried into position, and then placed in the manner described. It should next be pressed into position with sufficient force to bring the margins in contact with the dentine. Any excess of dressing should be taken away by light touches of an excavator, and when the cavity is to be filled temporarily it is better to fix the cap in place by flowing over it a little chloro-percha, which, when dried, prevents disturbance of its position in the filling procedure.

You should be careful that when the pulp is found exposed in a depression, as occurs sometimes in the molars, this depression should be filled nearly or quite to a level with the floor of the cavity by taking a little of the dressing upon a suitable instrument and carefully filling this point; otherwise, when the cap is placed, the paste may not find its way into contact with the pulp. In a few instances, in my earlier experience, I have been obliged to go over the case and recap on account of this difficulty.

At the moment of placing the cap, as the paste is yielding under the gentle pressure of forcing the edges of the cap into contact with the dentine, a little pain will be observed; but, unless the paste is too stiff, no compression of the pulp will be caused.

#### FILLING THE CAVITY.

Whether the cavity shall be filled temporarily or permanently depends upon the prognosis. This, as you will perceive, depends upon the constitutional conditions and the state of the pulp at the time of treatment.

To those of small experience in this line of treatment it would not be safe to attempt permanently stopping the cavity, except in accidental exposures, and in cases where no previous disturbance can be elicited. Even in the latter class it is generally best to delay permanent closure by a conductor of heat, until after an experience of a year or more with a non-conducting stopping. At the end of this time the filling may be nearly all removed, care being taken not to disturb the capping, when, with suitable precaution, a metallic filling may be inserted.

I have many capped pulps belonging to class *a* beneath gold fillings, where they have remained, without the occurrence of any irritation, for many years. But I must remind you that the utmost caution must be used in making the selection of cases to be filled permanently at the time of the capping of the pulp.

In the majority of instances it is safest to fill the cervical part with gutta-percha stopping, carrying the material over the cap, and then to complete the filling with zinc phosphate. In this way,

with an occasional renewal of this temporary work, cases may be carried forward from ten to fifteen years.

They may, however, be closed permanently and safely after an experimental trial of five years where no irritation has appeared.

This brings us to consider the conditions which take place with the pulp after the procedures which I have described before you. Concerning this there is no certain data.

Obviously the most desirable result would be the conversion of the exposed surface of the pulp into secondary dentine. This result I have known to take place within the period of two years, and I have opened for examination cases which have been capped, without the occurrence of any disturbance beyond the occasional impossibility by cold for periods as long as fifteen years, where no such change had taken place.

That in many cases recovery is by secondary deposits my records present a considerable number of instances. It is not remarkable, however, that pulps may remain in a state of quiescence for years, when it is considered that in slowly-advancing caries the pulp will often be exposed for long periods without the occurrence of any signs of irritation, unless, by the position of the mouth of the cavity, the pulp has been subjected to the pressure of food.

It may be concluded that, whether the pulp becomes protected by secondary deposits or acquires complete quiescence, conservative treatment in these cases has considerable advantages over immediate devitalization. Still, in this connection, I must repeat the necessity for the careful selection of subjects to be treated in this manner, and also for proper regard to the apparent condition of the pulp itself. To aid you in this discrimination I give you a classification of conditions.

#### CLASSIFICATION OF CASES OF EXPOSURE.

- (a) Where no previous observable disturbances can be elicited.
- (b) Where the tooth has been impressed only by the application of low temperature.
- (c) Where, in addition, reflected pain in related parts has been observed.
- (d) Where the tooth has become subjected to impressions by heat.
- (e) Where continued objective disturbances appear, such as soreness to touch, or local pain of spontaneous character or pulsations.

As the result of long experience, I am forced to consider classes *a*, *b*, and *c* entirely admissible to treatment, and also, problematically, class *d*, if taken early.

Class *d* when advanced, and class *e* under any conditions and circumstances, whether presented in the states mentioned or having become so, are fit subjects for devitalization; any attempts to conserve these usually resulting in lamentable failures, suffering to the patient, and impaired confidence in the judgment of the operator.

It is important here to consider the influence of the physical endowments of the patient upon the conservative treatment of the pulp. For some persons the treatment is followed by the happiest results; no impatience of the operation appearing, and even cases somewhat unpromising doing well. Again, with others, every case however simple goes down the gamut to class *e* in spite of every care.

The first constitutional condition favorable to success, as you will at once agree, is that of soundness. As to what are called temperamental indications when the subject is of good health, I should exclude only the lymphatic, and more particularly the bilio-lymphatic. These latter do not respond to pulp-treatment in any conditions which occur to them; and in reference to their exposed pulps the probabilities are, that in the sluggish condition of the parts involved the organ is early invaded by bacteria, and such changes have quickly taken place in the anatomical elements of the pulp as to render all hopes of treatment valueless. The most promising cases are those for persons of active temperaments, with good circulation, thin skins, healthy gums, and limpid oral secretions.

#### AFTER-TREATMENT.

I have now, in conclusion, to direct your attention to the after-treatment which may become necessary. It is presumed that the judicious practitioner has made careful selection of the cases to be treated conservatively, and that he will early decide upon the evident condition of those which preclude recovery. As previously indicated to you, some of the most promising cases will not yield to treatment. This consideration requires close observation of the cases for some time after treatment. The patient should be instructed to return for consultation should reflected pain occur or should the tooth become impatient of cold applications. If this should be apparent, it is a sign of needed care to avert increased disturbance.

A most marked form of reflected pain is felt in the ear, and this frequently appears before the temperature sense has become aggravated. So much importance should be attached to this symptom



of pulp disturbance that the first question to be asked a patient appearing with pain, or on approaching a suspected pulp, is, Have you had any pain in the ear of that side? Reflection to the ear occurs often long in advance of similar pain in other branches of the third pair.

In any case where the tooth has been impressed by cold, either before the treatment or afterwards, an application should be made to the gum over the tooth, of tincture of aconitum root, two parts, chloroform, one part. The mode of application is important. A pledget of cotton or muslin to cover an area of one-half by three-fourths of an inch should be filled with the prescription, then squeezed out nearly to dryness between folds of a napkin to prevent an excess flowing over the mouth and with the saliva entering the fauces, to which it is extremely irritating as well as unnecessarily medicating the patient. Before the pledget is applied the surface of the gum should be cleansed of the coat of mucus covering it, otherwise the remedy will fail to come in contact with the membrane. It is equally important that dryness of the surface be secured. This application should be maintained for from twelve to fifteen seconds. If allowed to remain too long upon the part, ulceration is established. The general after-treatment consists in the repeated application of aconitum, the application not being made at the same point more frequently than after intervals of forty-eight hours. When it is desired to increase the counter-irritation, the gum may be scarified very superficially by quick, light movement of a small scalpel. The patient should be instructed to avoid subjecting the tooth to extremes of temperature in either direction. The control period of conservatively-treated cases is within the first fortnight after the capping.

I have, however, had them appear after several years of complete quiescence with initial disturbances, and then yield to treatment. It sometimes becomes necessary to open the cases and recap. This usually occurs when in reviewing the case it is considered that some oversight has occurred. There may have been two exposures. The cap may not have completely covered the exposed part. There may have become compression from forcing the cap. It may have been displaced, the case may be determined to go down the gamut of irritation, and in despair we sterilize again and make another trial.

The most careful records of cases should be kept with a relation of the condition and of the controlling symptoms. These records should be methodically preserved in a book kept for this purpose.

Should subsequent irritation occur, a new diagnosis may be formed from the recorded facts and the new conditions. I am careful to have this class of cases carried forward to the examination chart at each recurring periodic examination of the teeth. They are marked in symbol with red ink to prevent the unnecessary removal of temporary fillings, to explain the reason for their presence, and thus to avoid the accident of an unnecessary uncovering of the pulp in such cases.

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## THE PHYSIOLOGY OF HYPNOTISM.<sup>1</sup>

BY ALFRED H. PORTER, D.D.S., PHILADELPHIA.

THE study of hypnosis differentiates two states, the auto-hypnotic or self-induced condition, and that effected by the more potent energies of the hypnotist in their irradiation antagonizing those of the patient. In regard to the latter, physicists have scarcely dared to conceive of such a mode of energy acting through space, much less have they attempted to subject it to experiment. The general willingness to explore the field now manifested by experimental scientists is due to the establishment of the marvellous essentially dynamic hypnotic phenomena on a firm basis without their aid; and to a well-founded belief that critical analysis must lead to the illustration and development of natural law itself.

The most natural explanation of the radiant energy of the hypnotist, since under certain conditions the tissue manifests its electrical currents, is that it is a type of electrical radiation.

Although Galvani's experiment on animal electricity in 1786 founded the ever-widening field of voltaic electricity, and led to modern electrotonic physiology, no demonstration has been made that the conditions required for the evident manifestation of electrical separation in the phenomena of electrotonus are analogous to the special physiological conditions required for the concentration of energies characteristic of both hypnotist and patient. This is amazing, for it is in spite of the fact that the more observant hypnotists incontestably have a sense of the efflux of energy, and the patients of its absorption.

Many may not be conscious of this subtle sense of effort and

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<sup>1</sup> Read before the Alumni Association of the Department of Dentistry, University of Pennsylvania, June, 1894.

impact, but even in normal life few have any conception of a muscular sense, and the far more important nervous sense concomitant with the discharge of energy in the nervous centres that constitutes the basis of every form of conscious and unconscious mental activity.

Leaving the protestation of the hypnotists of a subjective sensation out of view, the objective phenomena were striking enough to attract attention. Popularly the energy exerted by the hypnotist was termed "animal magnetism." Such designation and the fact that to magnets vicarious powers could be delegated apparently by the hypnotist or "magnetizer" led good physiologists astray. Because dummy magnets produced the same effect on the patient as the "hypnotized magnets," the idea that magnetism could explain the transfer of energy fell undeservedly into disrepute.

In many of its phases magnetism manifests essentially electrical phenomena, leading many to regard it as a mode of electricity; and it cannot be neglected in discussing the transformation of the chemical energies of the tissues into electrical energy in normal physiological states or the abnormal states of hypnosis, for Dewar has proved that under extreme pressure oxygen is strongly magnetic; and, moreover, the energies required for the association and disassociation of the gases of the blood form the *rationale* primarily of the respiratory and circulatory activities, and, ultimately, of the whole corporeal energies, visible and invisible. These electrical energies are initiated by the magnetism of the iron of the oxy-hæmoglobin of the blood attracting the oxygen. Further research would have led the experimenters to find that the mere perception of the dummy magnet had completely hypnotized the patient, and may be long before the school of Nancy to strike the key-note of hypnosis,—the potency of suggestion.

It is well to remember that the electrical discharge and the phenomena of attraction and repulsion are forms of one all-powerful irradiative agency. The most comprehensive idea of electric action is to imagine that in one place opposing energies have condensed or coiled up the all-pervading ether. The release of this would mean the propagation of waves of all amplitudes, intensities, alternations, in all directions, forming central nodes of rest and surrounding vortices. The coincidence of crests with troughs would form places of absolute destruction of motion, enabling us to conceive of electricity as being vibratory, instead of an uninterrupted stream of energy.

This extensive idea of the operation of electricity is supported by epoch-making discoveries of the last few years by Hertz, of Vienna. Electrical currents no more fairly represent the possibili-

ties of electricity than a river represents the opposing seas and maelstroms of Cape Horn.

Let us apply this expansive idea of coil and recoil of the ether denoting the electrical discharge to animal electricity, remembering that a current of electricity is the concentration of energies otherwise diffused; kept in one direction by the wire, just as the narrow bay of Fundy concentrates the tides of the Atlantic Ocean, or a speaking-tube concentrates the ample air vibrations. We will begin with Galvani's time-worn experiment, where the muscle contracts in the neighborhood of an electrical discharge. This discharge is obtained by the contact of two heterogeneous metals. The surface particles of the metals are vortices of different potentials; they will, as it were, unwind the energies of each other, producing a disturbance of the ether, but the ether-waves, although measurable by physical apparatus, are too long to be noted by the eye or ear, much less the grosser forms of tissue that form the nerves and muscles of the limbs. The fact is, the muscle and nerve will not respond to such waves. In physical language, the nerve-energies will not resonate to such long feeble waves. By his wire Galvani condensed them into a current, the response of the nerve-cells was immediate, their energies which maintained the natural tonus of the nerve and muscle were inhibited, and the contraction ensued. This contraction, like the idio-muscular, spasmodic, tetanic, rigor-mortis and all pathological-forms, indicates functional disintegration of controlling nervous centres, and is precisely the hypnotic state of energies.

The prime cause of the waves was, as we have said, the discharge of energy consequent on the contiguity of two heterogeneous metals. The question at stake is, Are the heterogeneous energies of hypnotist and patient analogous to those of the metal? and are their contiguity and mutual attention equivalent to closing a circuit with a wire? Moreover, do the energies of the patient succumb to those of the hypnotist because of lesser momentum and negative character?

The phenomena of nerve and muscle electrotonus are easily apprehended with this idea of the diffusive, undulatory, vocative action of electricity. The anelectrotonic condition in which the constant current or concentration of energy increases the natural energies is the condition of the hypnotist. The kata-electrotonic condition, where the same energies are inhibited but the impressibility increased, is that of the patient. Let us consider that the anelectrotonic and kata-electrotonic activities are manifested in the same nerve or muscle and by the same constant current. A similar

opposite condition prevails between hypnotist and patient, who both concentrate their energies.

The design of this paper is to elucidate, however, the auto-hypnotic condition, as to which no speculation is needed, standing on an unassailable foundation, and accounted for rationally by normal physiological operation and the abnormal pathological states of dementia.

The condition goes as far back as history records; indeed, it seems to have formed the basis of ancient mythology and medicine. As in chemical anæsthesia, the operator is an adjunct, but with powers far transcending the administrator of the narcotic, for the sole reason that the patient is amenable to suggestion.

A disk is placed before the patient, the continual perception of which induces hypnosis.

The simple condition of undivided attention is fulfilled in many ancient and modern religions, producing essentially the hypnotic state. The idolater, gazing reverently on the face of the idol, the more rapt his gaze, saw a halo of glory surround the head apparently. The continuous incantation of the priests was the similar continuous stimulation of another sense-organ, and accelerated his reverie. There was certainly no super-natural efflux of energy from the idol, but there was the natural efflux or rebound of invisible waves of energy termed light, as there is from every object of vision. Were it not for this irradiation and various intensities, amplitudes, and alternations of the waves, no idea of any color, size, or configuration of objects would be obtained. After all, they are our old friends, the electrical waves,—precisely speaking, electromagnetic waves,—more intense and of shorter wave-length, just long enough to cause the response of the myriads of rods and cones with which the retina is studded.

We must understand that the very invisibility of the waves enables us to perceive any object, for, to give us an idea of a large object, many crests must coincide to form a wave of large amplitude and correspondingly affect the retina. If the amplitudes of the waves increase, as they often do from mist or other physical causes, the object would appear larger.

Indeed, as the sun declines, the approaching uniform hue of the landscape and the loss of detail of configuration is simply due to a coinciding of the wave-lengths and amplitudes.

The physiological text-books tell us that an image exists on the retina, and in some inscrutable way the brain transmutes the image into perception, and, in a similar way, transmutes the waves

of energy that traverse the auditory nerve into sound. This is essentially misleading, and has hindered an accurate conception of the nervous energies of the brain.

Retina, optic nerve, and central brain cell in the optical centre are anatomically continuous and they are physiologically continuous. The electrical vibratory image exists on the retina, optic nerve, and central cell, in one specific phase of energy. Each contributes impartially its share for the energy of perception. But apart from this identical action each has a specific function in relation to the environment. The retina responds to the million phases of energy forming the visual world; its function is to respond to many of them simultaneously, for which purpose its nervous layers admirably adapt it. The function of the optic nerve is to convey these vibratory pictures just as wires through electric stress are made to carry them in the physical laboratory, but the supremacy of the brain lies in the fact that it retains them. Yet that retentive power is not a mode of perception. The restimulation of the cell forms the basis of memory; its response to a like phase of energy from the optic nerve is the basis of recognition; the interaction and expansion of the energies of the cerebral cells form the basis of deliberation; their manifestation of kinetic energy is the basis of the tonicity of the centres, and effects the restraint of their mechanical action characteristic of the normal man.

We shall endeavor to demonstrate that the continued stimulus of the retina, tympanum, or any sensory apparatus leads to the removal of this inhibition, and leaves each cell open to the stimulus of suggestion without power to antagonize it,—the physiological *rationale* of the hypnotic state.

(To be continued.)

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## THE PATHOLOGY AND TREATMENT OF PULPLESS TEETH.

BY DR. W. H. WHITE, SILVER CITY, NEW MEXICO.

DURING the past two years I have been using methods of treatment in these cases that are partly original with me, and have had such marked success that I now approach them with far more confidence than I formerly did. But before going into the details of

treatment, it is best to get as clear an idea as possible of exactly the conditions we have to treat.

In studying the human body we are too apt to look at it only in the light of an individual,—of an entirety,—just as most people look upon the ocean as something to sail ships on or for fish to live in; but the chemist is more interested in a molecule of water than in an ocean. It is for him to study the attributes of a single molecule, its component parts, its affinities, its likes and dislikes; for when he understands one molecule, he understands every molecule of water in the whole ocean. It is so with the surgeon. He should study the minute component parts of the body, learn their nature, their methods, and their capabilities.

Life begins in a single cell of microscopic size. Our bodies are communities composed of the myriad progeny of this cell. When life first dawned on this planet, they were beings composed of a single cell. These we say were created by divine power, for as yet we have not been able to account for them in any other way. These cells, to a degree, had all the functions that our bodies have,—the sense of sight, touch, nervous and muscular power, the ability to digest and assimilate food; they propagated themselves simply by division, each half becoming a fully-developed being. With the production of these the creative power stopped. All the other phases of life which we see are due to development, to community of interests, to specification, to heredity.

But these small, single cells soon began to have enemies to contend against, and so some varieties gradually discovered that, instead of living alone, they fared better and were better protected living in communities.

Next the laws of heredity and of the physiological division of labor, as expounded by Professor Darwin, began to have their effect on these communities; those cells on the outside of the community began to perfect themselves in methods of warding off the attacks of enemies, while the cells of the interior, relieved of the necessity of self-defence, gradually perfected themselves as muscle-cells, nerve-cells, bone-cells, etc.

All life is simply microbic, the difference being that some live singly, while others live in communities.

The human body is one of these communities; it is in many respects the highest result of this law of the physiological division of labor in the animal kingdom. As a result of these laws our bodies have become aggregations of cells of very varied functions, as an outside covering in the skin and mucous membrane; they

have an almost impenetrable armor for the protection of the community; while within they have cells highly developed and highly specialized to perform their allotted functions.

It must be remembered, however, that while these interior cells have thus been developed and specialized, they have at the same time lost at least one very important ability,—namely, that of self-protection. They have gradually lost this from several causes. First, because they are so well protected by the skin and mucous membrane surrounding them; secondly, they are individuals of very sedentary habits. They have slaves to wait on them,—to bring them their food, drink, and fuel. They also have masons and builders to repair any breach in their structure, and soldiers to expel intruders. From these causes they have become very effeminate, and are entirely incapable of defending themselves from their enemies. The red blood-corpuscles are the slaves of this community; they are the “hewers of wood and drawers of water.” The white blood-corpuscles are the masons and builders; they are also the soldiers of this human hive.

It is the functions, abilities, and methods of these leucocytes that we should study most carefully, for all that the surgeon can ever do is simply to assist them to do their work. It therefore behooves us to learn thoroughly what these can do; learn the conditions necessary for their successful work and their methods of doing this, so that we may assist and in no way hinder them; learn what their enemies are, and how to remove or destroy these without at the same time injuring them.

Now, in studying these things, suppose a thorn is thrust into the body; what takes place if things are allowed to take their natural course? First, there is irritation to the nerves caused by the thorn. This immediately notifies the sensorium that something is wrong, which, in turn, directs an increased flow of blood to the part. This determination of blood to the part soon fills the vessels there to their utmost capacity, causing congestion and final stagnation of the blood. This is the community's method of fighting its enemies, and it is this ability to concentrate its whole force at one place that makes the community powerful over that of its individual members.

The leucocytes in the normal blood-current move aimlessly along without apparent object or use, as sentinels upon duty. When the part becomes inflamed, they adhere to the walls of the vessel and possess the ability of creeping through the wall into the surrounding tissues, and as they pass through the tissues they leave a



canal behind them. This is a new capillary through which they receive sustenance, for they are careful soldiers and do not want their base of supplies cut off. When they reach the tissues, a wonderful change takes place. Under ordinary circumstances the leucocyte would travel along the blood-vessels for an indefinite time as a single individual, but when it reaches the tissues it begins to multiply sometimes with great rapidity. The young leucocytes are packed in and around the thorn, their base of supply is cut off; but this is immaterial, as they increase until the thorn is expelled by pressure of numbers. With this flows a gush of pus. This pus is composed of the bodies of these leucocytes slain in the struggle. This kind of pus is what the surgeons call laudable pus, and well it is so named, for the heroes who defended the pass of Thermopylæ were not more laudable than these.

The vital powers now exude serum which quickly coagulates and forms a scab, then no more pus is formed. The leucocytes now change their function from that of soldiers to that of masons and builders, but instead of using bricks and mortar, they build in their own bodies and the bodies of their children to repair this breach, each one going forward to take its place and leaving a canal (capillary) behind through which it receives its food, until the entire breach is repaired.

But why did the vital powers use such haste to throw out this scab? Why is it that the body is everywhere surrounded by this armor of skin and mucous membrane? The reason is this: in every particle of air, in every drop of water, ever present, ever aggressive, is the *microbe*. There are carnivorous microbes; there are herbivorous microbes; there are lithivorous microbes; there are omnivorous microbes. A microscopic world of which our eyes unaided take no cognizance. Their numbers are myriads, even their varieties are innumerable. A German scientist has lately counted sixteen thousand five hundred microbes to the square inch of material taken from the floor of a first-class railway coach, so that when a person sits in one of these seats, which by the way are supposed to be kept clean, he is surrounded by from one to two hundred million of these minute organisms. From the secretions of the mouth there have been pure cultures made of at least twenty-two distinct varieties of them. No germ of life too pure for their fastidious taste; no loathsome carion too foul to deter them from feasting. These are the ancient and hereditary foes of the human cell. To ward off these was developed this armor of skin and mucous membrane. To keep out these the vital powers hastened to throw out this scab.

But if this scab be disturbed, or is imperfectly formed, then the microbe enters this breach made by the expulsion of the thorn, attacking the young and tender leucocytes, and these cells pass off as pus.

Then the vital forces renew their energy, blood is determined anew to the part, leucocytes are increased, and if the breach is not too deep, or if the microbes have not an opportunity to propagate themselves, then, in spite of thousands of leucocytes being slain, the vital forces usually succeed in repairing the breach. But with a deep pocket that cannot easily be cleaned, then the microbes will multiply wonderfully fast and devour the leucocytes as fast as they appear. The vital powers, after a long and unavailing effort, give up the attempt to repair the breach, and then construct a wall of defence before the healthy cells. This wall of defence has been miscalled a pyogenic membrane, but it is in no sense pus-breeding; it is simply a wall that the vital powers erect to keep the microbes from invading the healthy tissues. Having given up the contest, the vital forces retire behind this wall of defence, the inflammation subsides, the determination of blood to the part ceases.

Here we have a chronic ulcer. In cases where the vital powers are too weak to thoroughly construct this inner wall of defence, the microbes invade the healthy tissues and feed on the highly specialized but effeminate cells of the interior of the body. Then we have a phagedenic ulcer.

At first thought it would seem impossible that the cells of the body could withstand the continued attacks of these microbes, and, in fact, taken singly, the cells of the interior of the body are entirely incapable of contending with them; but it is the great power of community, of interests, the ability of the whole community, to concentrate its fighting force at one place. It is this *vis a tergo*, this so-called vital force, that usually enables the community to come out victorious. At any rate, we know that the human cells have fought these battles during the ages of the past, and have not only come out victorious, but have perfected themselves until they now constitute the most powerful organism that the world has yet produced. In the words which Shakespeare puts into the mouth of Julius Cæsar, "Danger knows full well that Cæsar is more dangerous than he. We were two lions littered in one day, and I the elder and more terrible."

Now, a tooth is but a specialized part of the mucous membrane, and is, therefore, part of this armor which covers and protects the effeminate cells of the interior. When a tooth is decayed and the

pulp is destroyed, an opening is made through this armor, allowing the microbes to reach and attack the interior cells. This is the usual natural cause of alveolar abscess. As to treatment, it is in a few words,—destroy the microbes and protect the human cells.

We have many germicides and antiseptics, but the great point to be borne in mind in using these agents is that we have two sets of germ-life here side by side; the one it is necessary to destroy, the other it is just as necessary *not* to destroy, but to keep alive and healthy. As an illustration of what we should accomplish, it is known, for instance, that Persian insect powder is entirely harmless to lung-breathing animals, but is deadly poison to insects.

The germicide that should be used is one that would kill the microbe, but be entirely innocuous to the human cell. Creosote and carbolic acid are good germicides, but they are also cauterants; they kill the microbes but also kill the human cell. Bichloride of mercury is a good germicide, but it is poisonous to the human cell; it is also a coagulant of albumen, and, meeting the serum of the blood in a fine pulp-canal, coagulates the albumen, makes a dam, thus defeating its purpose of reaching the microbe in the apical space. Oil of cloves is an irritant. Iodoform is not sufficiently penetrating.

The properties of the agent we use should be (1) germicidal, (2) non-coagulant, (3) penetrating, (4) non-cauterant, non-irritant. The oil of cinnamon so nearly meets all these requirements, and is so effective in practice, that I have discarded all other remedies in the treatment of these cases. It also has the virtue of producing a pleasant odor in the office instead of a disagreeable one.

Having cured the ulcer, the next step is to so fill the root-canal as to effectually keep out the microbes. At first thought anything that would perfectly seal the canal would answer the purpose, but practically it is found that in some teeth with crooked roots, and, in fact, in most teeth, it is practically impossible to clean and fill perfectly entirely to the apical foramen, and when we do our best there is more or less of the canal near the apex that is not perfectly filled. Our root-filling may protect this part of the canal from germs from without, but it may not protect it from germs from within. I believe there are some varieties of germs in the blood which have the nature of a ferment. They do not attack living cells, therefore they are tolerated within the system; but coming to the apical foramen, they find dead matter and begin to devour it. They exhale gases which soon become a mechanical irritant. These germs do not kill leucocytes and thus form pus, but the pus

formed in these cases is of the laudable variety ; it is leucocytes killed in the attempt to expel this gas. This is the cause of apical inflammation in cases where a tooth has been, by a blow, loosened and the pulp killed, but without any decay or communication with the exterior. The difference in the odor is marked, on opening such canals, from that of canals to which microbes have access through caries. It is characteristic of carbonic acid gas, instead of the fetid sulphuretted hydrogen.

A mere mechanical stopping, like gold, does not therefore fill the requirements. Oxychloride or phosphate of zinc, while serving as good antiseptic for a time, are also poisonous to the human cell ; but their antiseptic powers are soon lost, and, being somewhat porous, they absorb the secretions, and thus become a harbor for septic matter. Cotton saturated with creosote or carbolic acid is worthless, because, while irritating to the human cells, their antiseptic power is soon dissipated. Gutta-percha is a good mechanical stopping, but is not antiseptic and is difficult to thoroughly introduce. Chloro-percha, when carried into a pulp-canal and sealed up, must necessarily shrink when the chloroform evaporates, leaving the canal imperfectly filled ; besides, the chloroform, vaporizing, must form a gas which theoretically would itself be an irritant.

The essential qualities for a root-filling are : 1, that it must not only be antiseptic, but must be permanently antiseptic, retaining its antiseptic powers for an indefinite length of time ; 2, it should be non-escharotic, non-irritant, innocuous to the human cell ; 3, impermeable to the fluids of the body ; 4, non-shrinking, non-dissipating ; 5, easy of introduction.

It is not so necessary that it should be a strong antiseptic as that it should be a permanent antiseptic. One of the least essential qualities is that it should be hard, for near the crown oxychloride makes a good filling to base metal fillings on.

The proper place to look for such a material is in the products of the vegetable kingdom. My reasons for thinking so are these : Animals have many ways of removing the parasites which bother them. They also have the ability to concentrate the entire fighting force of the organism at the place attacked. But trees are stationary, and the only way for them to get rid of these enemies is to secrete some substance which is poisonous to these. Probably all plants protect themselves more or less perfectly in this manner. These poisons must necessarily be such as will not injure the wood cells, and the wood cell is similar to the animal cell ; so we are more likely to find a substance among these products that is at once

poisonous to the microbe and innocuous to the human cell than among mineral poisons which have had no such tests. Besides, the vegetable poisons are more permanent in their character.

I have seen petrified wood where parts of the specimen impregnated with resin have preserved the wood fibres intact since the miocene epoch, while the balance has been changed to stone. These resins are principally hydrocarbons, and would naturally be good food for microbes; but with it is secreted a subtile poison that effectually keeps them away, not only from the resin itself, but from the wood cells about it. You know that amber is a fossil resin, many specimens of it show flies and insects which have been perfectly preserved since the tertiary age. A million years would be a small estimate of the time they have been there.

The reason why the coal-fields were deposited is not that vegetation was more abundant during the carboniferous age, but that the plants of that age secreted powerful and extremely permanent antiseptics, thus preserving the carbon from decay. Some of the strongest antiseptics we have now are derived from these coal products.

Antiseptics which have been distilled from vegetable compounds are not so good as the original compound, because, being separated from their original menstruum, they often lose the essential quality of permanence. The vegetable kingdom secretes almost as many different kinds of antiseptics as there are varieties of plants. Many of these secretions are not only poisonous to the microbe, but are poisonous to the human cell as well; and, therefore, should not be used. Many of these secretions, like cinchona, are good antiseptics, but soon lose their power and become worthless as a root-filling. In some the substance of the secretion dissipates, in others the antiseptic qualities deteriorate.

Some three years ago my attention was attracted to a resin which the Indians of Arizona call "balsamo del deserto." It is found in almost a fossilized state, and has withstood the ravages of time probably for centuries, perfectly preserving any substance which it may inclose. The Indians melt this and thoroughly cover any wound they may receive. I have seen the skin torn off an inch in diameter and the tissues badly bruised and lacerated covered with this material, and healing would take place by first intention, without pain, almost without swelling or the formation of a particle of pus. I have seen it applied to suppurating wounds where doubtless microbes were present, and healing take place without further pain, swelling, or discharge of pus. This shows that this

material is innocuous to the human cell, and that it is an efficient germicide and antiseptic.

In filling root-canals with this material, of course nothing but long experience can fully determine its value. So far I have never known apical inflammation to recur after the root-canals were filled with it.

During the past year I have not even attempted to remove the dead pulp out of fine root-canals, simply taking that which could be extracted easily and inserting this material, and have so far had apparently better results with far less exacting labor than by the old methods. And I have every reason to believe that the treatment will be permanently successful, for I know that I am placing into these roots a material that is an efficient antiseptic, and that will retain its substance and antiseptic powers for a lifetime, and that is harmless to the human cell.

In preparing this balsam for use, I place the bottle in warm water to soften the material and then work it well into the pulp-canals. Then place a few fibres of cotton on a broach, and heat the latter over a spirit lamp about an inch back of the point. If the broach be kept slightly warmer than the tooth, the cotton will leave it and is readily worked up the canal. After the first cotton is in place I frequently saturate the additional pieces with the balsam before introducing them. The balsam is so adhesive that if this method be used for the first piece, it is liable to force a cushion of air before it. The balsam is non-irritating, and if pain be caused, it is evident too much pressure is being used, or that there is air above it. If this happens, it should be withdrawn and reinserted with more care. The canal-filling can at any time be readily removed.

The fluids of the mouth cannot permeate or deteriorate this material. It is not even necessary to fill the cavity of decay for trial canal-fillings. At the temperature of the blood the balsam is so adhesive that it will displace water and adhere to the wet surface. In chronic ulcerations, where I felt confident that tartar had collected near the apex, I have forced the material through the apical foramen and effected a cure. The theory was that the balsam would flow over the tartar and present a smooth surface, resulting in the formation of healthy tissues. I have no positive evidence that this was accomplished, as I have had no occasion to extract a tooth so treated.

In cases of abscess with fistula, I frequently cleanse the canals and fill with balsam without previous treatment, and the following

phenomena are usually presented. After the lapse of a few hours there is increased apical inflammation with an additional flow of pus, accompanied, perhaps, with pain. The first thought would be that the balsam had increased the irritation, but as the parts soon heal perfectly and remain without change, I am confident the inference is fairly drawn that this increased inflammation is nature's process to effect a repair, which it is always prepared to accomplish when the parts are free from microbic life.

This is the only material that has given success in the filling of canals of temporary teeth. My former practice was to make a vent in such teeth, but now I fill the canals.

I frequently fill directly on the canal-filling with amalgam, but where gold is used the canal-filling should be covered with oxy-chloride.

I have had some difficulty in procuring this material on account of its locality, but should there be a demand, the supply would be abundant.

[We have, through the kindness of Dr. White, received a sample of this balsamo del deserto. Whether it will prove the long and ardently desired ideal canal-filling material remains to be proved, but all the indications point to a valuable addition to our altogether too limited list of materials.—Ed.]

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## THE TECHNIQUE OF NERVE RESECTIONS FOR THE RELIEF OF PAIN ABOUT THE FACE AND JAWS.<sup>1</sup>

BY M. H. CRYER, M.D., D.D.S., PHILADELPHIA.

MR. PRESIDENT AND GENTLEMEN OF THE ACADEMY OF STOMATOLOGY,—It gives me great pleasure to have the honor of presenting the first essay to this body for its consideration and discussion: the more so as the name of the society marks the recognition of a distinct evolutionary advance in our professional relations. The intelligent practice of what has come to be considered within the legitimate province of the dentist to day includes so much more than the mere technique of dental operations that a more comprehensive designation of the field is not only desirable but necessary.

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<sup>1</sup> Read before the Academy of Stomatology, Philadelphia, October 6, 1894.

My gratification over the name "stomatology" for this society is, I believe, shared by every one of you. Indeed, the term might have been chosen some time ago, as the dentist has long since outgrown the limitations of his original field in which he devoted himself exclusively to the care and the treatment of the teeth. In the pursuit of his calling he naturally became more familiar with the functions of the mouth and its associate parts, until now he is fully equipped to deal with all complications connected with, or dependent upon, diseased conditions within his especial territory. And not only in his immediate department has this impress been made; many allied branches claim his devotion and intelligence. His trained mechanical ability has enabled him to produce the best microscopical sections of the different tissue connected with the mouth in all stages of their development. We are also proud to know that from our ranks have come the finest bacteriological studies of these regions that have been made. So brilliant has been the development of bacterio-pathology of the mouth as compared with general bacterial pathology that it presents the spectacle of a branch growing out of the parent stem. We are shortly to celebrate the fiftieth anniversary of the application of anæsthetics. This greatest of blessings to suffering humanity is due to the intelligence of Horace Wells, a dentist. In the mechanical department, the characteristic inventive spirit has been strongly manifested; instruments and methods are being constantly improved and new ones devised. The activity which has characterized the development of our knowledge of oral science, as just noted, is seen in all its departments. Our knowledge of pathological conditions and their rational therapeutics has made rapid strides until the great majority of morbid processes are fairly controllable by appropriate treatment. This general advance is, as a natural consequence, reflected in our educational methods, so that the equipment of the dentist of to-day is necessarily more thorough and satisfactory than was formerly possible. In view of these facts, it would seem to be quite within consistent limits to adopt the more comprehensive title by which the association is designated; a term which distinctively describes the broader sphere of activities, which is by common consent the legitimate field occupied by the dental practitioner of the present. The department of oral surgery is one which in my judgment has occupied a somewhat anomalous position in the past. The operative measures for relief of pain about the face and jaws have been conducted almost exclusively by general surgeons. It will hardly be gainsaid—certainly not by this audience—that but



few general surgeons have the training necessary for producing the special manipulative skill demanded for this work. I mean by this the kind of manual dexterity which is the acquirement of the properly-trained dentist. I should be lacking in historical accuracy as well as in loyalty and due appreciation were I to omit paying just tribute to the achievements in oral and general surgery of one who, beginning his training in the ranks of dentistry, has by his natural abilities and special qualifications of heart and mind won fame for himself and honor to his calling. It is the class of operations so closely identified with the life-work of Professor James E. Garretson that will form the basis of my communication this evening. The subject proper being the technique of these operations, we may dismiss all consideration of reasons which compel them.

It is assumed that a diagnosis has been made of a lesion affecting a nerve-trunk; that we have excluded the possibility of the disorder having peripheral cause. We assume the existence of a lesion not peripheral, and will consider operations upon the great branches or trunks of the superior and inferior maxillary nerves. There is one problem which confronts the surgeon here, and that is the leaving of disfiguring cicatrices, a question which scarcely concerns those who operate upon parts of the body which are hidden. This necessitates or makes advisable that we operate with as small an external opening as possible, after selecting such place as will leave the least noticeable scar. Much of his work is done, therefore, in the dark, his sole dependence being the sense of touch combined with accurate or absolute anatomical knowledge. It will be seen from this that these operations require the most delicate skill combined with a refined technique. The instrumental means prior to the past ten years, as they are now with some, are found in tenotomy knives, mallets, chisels, directors, scissors, and saws. A reference to Carnochan's work will give much of the history of these operations. Descriptions may be found in Gross's, Agnew's, or better, in Garretson's surgery. You are presumably familiar with Langenbeck's operation upon the infra-orbital nerve; this consists in cutting the trunk just beyond the speno-maxillary fissure by a tenotomy knife thrust in from the outer and lower margin of the orbit; following this by an incision below the line of the orbit to the infra-orbital foramen, where the severed nerve is caught and withdrawn. All other operations that I will describe, save this one, require bone section; for this there is no device approaching in completeness or effectiveness the improved surgical engine, with its perfected instruments, most of them evolutions of the dental-engine burs.

There are several operations for the resection of branches of these nerves which are of superficial relation exclusively; as they are comparatively simple, we will proceed at once to consideration of the deep sections. There are two principal operations for the resection of the superior maxillary nerve: one of these is in the posterior portion of the orbit, the other in front of and as near the round foramen as possible, this last involving the removal of Meckel's ganglion. The first operation is nicely accomplished by the following method, somewhat after Stoker: the eyelids should be closed by a single suture, then a curved incision made along the infra-orbital ridge down to the bone, then a vertical cut downward to the infra-orbital foramen. Spreading the soft tissue, remove the periosteum from the bone covering the canal, and secure the nerve with a ligature, then pass a dental nerve-canal plugger into the foramen over the nerve, as a director and guard, along the canal, until the point is in the orbit; by using a small surgical bur the bone of the roof of the canal can be quickly cut down to the protecting plugger, when the nerve may be lifted from the canal intact. Now pass the nerve with the attached ligature through the opening of a neurotome, which must be worked backward as far as possible; then, holding the nerve tightly, revolve the cutting portion, and the nerve will be severed close to the spheno-maxillary ganglion.

The second operation may be performed in two ways: the first and, to my mind, better one is to make a trap-like opening exposing the greater portion of the anterior face of the superior maxillary bone, find the foramen, and secure the nerve as before, then with the engine remove a portion of the face of the bone immediately below the foramen, thus opening the maxillary sinus. Control all hemorrhage as far as possible, and, again using the engine, open through the inner and superior portion of the posterior wall of the antrum, and enter the spheno-maxillary fossa, thus exposing the Meckel ganglion. By passing a long, delicate nerve-canal plugger below the nerve as a means of protection from the engine-bur, the bone of the floor of the canal may be cut away, using a long-shanked bur. Those unaccustomed to the use of a surgical engine could use in its stead a long slender chisel with one edge prolonged. This prolonged portion of the chisel will pass along the floor of the canal and act as a guide, while the chisel proper will cut away the floor. After the floor of the canal has been removed, the plugger may be withdrawn and the nerve dropped into the antrum and passed through the fenestrated opening of a neurotome large enough to include Meckel's ganglion; pass the neurotome back-

ward to the round foramen, keeping the nerve tightly drawn, revolve the knife, and divide the nerve, then pull it away.

There are many operations for the resection of the branches of the inferior maxillary division; but I shall take only those requiring bone-cutting. Professor Garretson's plan for the resection of the nerve within the inferior dental canal is as follows: An incision is made in the soft tissue of the chin under the jaw so that the resulting scar will be hidden by the tissues under the border of the inferior maxilla. The tissues are now elevated so as to lift the cut upward in a line passing over the inferior dental canal, holding the lips of the wound apart with retractors; the bony covering of the canal is then exposed and ready to be removed. Originally Hay's saw, a mallet, and chisel were used in this operation. An improvement in this was using the ordinary dental engine and cutting two parallel lines with a small circular saw, and uniting the two lines at each end by boring the bone with a bur or small trephine, thus completing the section. The strip of bone may then be lifted from its position, thus exposing the nerve. As the more powerful engine and specially adapted burs were introduced, this operation of uncovering the canal could be better and more quickly accomplished. After the bone is removed the nerve may be lifted from the canal and a section taken from it, after which the soft parts are closed by interrupted sutures. The wound soon heals, leaving a small scar in such a position that it does not show, except upon close observation.

Professor Agnew's operation is to make a trap-like opening over the lower half of the ramus, remove a portion of bone by the use of a trephine, thus uncovering the canal, when a portion of the nerve may be removed. These operations frequently give relief for a brief period, but usually there is a recurrence of the pain. After resection nature endeavors to replace the lost tissues by similar new growths, which take their place, and frequently the bony tissue of replacement encroaches within the canal to a greater or less extent. These new nerve-fibres are liable to become entangled in the new bone formation; the pinching or pressure resulting from this may cause a recurrence of the neuralgia. At the present time it is regarded as more advisable to make the resection between the inferior dental canal and the base of the skull. If the canal and nerve could be obliterated so that the latter could not again grow into the bone, I believe a permanent cure could be made in some cases. This might be prevented by sealing the inlet to the canal by a gold plug, but as this might act as a foreign body, it is possible

that a sterilized sponge packing might induce a secondary deposit which would obliterate the canal.

The third operation is another one of Professor's Garretson's, and is similar to that described by Professor Agnew, except it is made a little higher and opposite the inferior dental foramen, thus exposing the nerve at the opening of the canal, where it is seized by a forceps and then dissected out from the tissue, and severed as near as possible to the oval foramen. The difficulty in this operation is the lack of space; there is also much danger from hemorrhage, so that the operation is not as satisfactory as we could desire. Recognizing this, Professor Garretson adopted in its stead what is known as the Pancoast operation. This consists in making an opening through the soft tissue on a line with the lower edge of the zygomatic arch, separating the tissues until easy access is obtained to the coronoid process, and sawing it off. In this way both the inferior and superior maxillary nerves are accessible, and may be excised near their respective foramina of exit from the brain. The objection to this operation is that it causes too great a loss of the temporal muscle on that side. It is also difficult by such operation to gain access to the nerve as it enters the inferior dental canal, on account of the awkward position. The intrusion of adipose tissue into the incision and the difficulty in taking the inferior dental nerve up from this point suggested to me some four years ago that, instead of cutting away the coronoid process, the sigmoid notch might be deepened to the inferior dental canal. To do this, expose the bone, take a barrel-shaped surgical bur having a smooth or safe end, remove the bone almost to the foramen, after which lift out the nerve, artery, and vein with a tenaculum, then separate and secure the nerve by hæmostatic forceps above the point at which the mylohyoid nerve is given off; draw as much of the nerve from the canal as will come, and cut the mylohyoid nerve as near to its point of origin as possible. If the dissected portion of the nerve is long enough, pass it into the neurotome; if not, attach a ligature and pass it in in that manner, holding the nerve tightly, with the point of the neurotome in the direction of the oval foramen; when this instrument can be passed no farther, revolve the knife and cut it as in the other operations. I believe the Garretson operation last spoken of is the best plan, to remove the nerve at the oval foramen if the neurotome spoken of and hereafter described is used.

The proper amputation of the nerve at the oval foramen is one which involves no little difficulty at times by reason of the hemorrhage and the limitations imposed by the surrounding tissue, which

interfere with direct vision. The bony structures offer an unyielding resistance to the use of any of the special instruments which have heretofore been used for the purpose. To obviate the difficulties which I have noted, and to furnish a means for the amputation of the nerve with certainty and precision at the exact point desired, I have devised an instrument which I call a neurotome. It is constructed of steel, and consists of an outer tube with a fenestrated end, the free extremity of which is rounded or tapered, and having on its inside surface, near the end, a projecting shoulder which is continuous around the inner periphery of the outer or canular tube. The inner cutting portion of the instrument consists of a steel spindle, which fits closely and smoothly within the outer tube, and has its free end fashioned into a tubular knife similar to a cork-borer or leather-punch. In use, after the nerve has been dissected out from its canal, its end is passed through the distal opening of the neurotome and out through the fenestrum in its side. The instrument is gradually pushed along the nerve, and worked in the direction of its foramen of exit. When it has been ascertained that the end of the neurotome has been brought into close contact with the bone at the foramen, and the nerve is made tense by traction, the central cutting-punch of the neurotome is driven home with a rotary motion against the shoulder mentioned before at the end of the outer canular tube, which will cleanly sever the nerve at the point desired, with no risk of injuring the deeper structures or the adjacent blood-vessels.

Since first describing this neurotome, Dr. Thomas G. Morton, of this city, has shown me one of his devising; the knife, however, is on an outer working tube instead of inside. The cutting-edge abuts upon a projecting shoulder from the fenestrated end of the inner tube.

The operation of deepening the sigmoid notch was reported by me in August, 1892, at the American Dental Association. It was published in the November number of the *Dental Cosmos* of the same year. The operation had been performed twice at the Medico-Chirurgical Hospital before I reported it. In the English *Medical Times and Gazette* for December, 1892, Mr. Victor Horsley, M.R.C.S., reported his operation of deepening the sigmoid notch, the principle being the same, the cutting of the bone being accomplished by different mechanical means. After an interview with this gentleman, a few weeks since, when he made a minute examination of the improved surgical engine, he expressed himself as thoroughly satisfied as to its utility in simplifying bone operations. Mr. Chris-

topher Heath, M.R.C.S., also expressed himself as much pleased with the Yankee invention. It has been my desire in bringing to your notice this cursory study of the technique of nerve resections, to especially call your attention to the marked improvements in method which are the direct outgrowth of the application of dental thought, ingenuity, and inventiveness. If by so doing I have in some degree led you to share my belief that oral surgery is a department, which, regarding the best interests of humanity, should be solely intrusted to the care of the properly-trained stomatologist, I shall feel more than gratified.

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### COAGULANTS: A FURTHER REPLY TO DR. KIRK.

BY MAX GREENBAUM, D.D.S., PHILADELPHIA.

THE position taken by Dr. Kirk, in his recent article "Coagulants in the Treatment of the Pulp-Chamber and Canals," has, we believe, been shown to be far from convincing, and far from its purpose to disprove the assertion that such coagulants as carbolic acid or zinc chloride are detrimental when employed in canal work. The main-stay of the argument appears to be the principle of osmotic action, and we may permit ourselves to say that if osmosis has anything to do with the determination as to whether certain coagulants should be excluded or included in the treatment of the root-canal, Dr. Kirk has not made it apparent that it is so. It seems reasonable that if it is desired to present an argument which should convince those whom he is criticising, no irrelevancy or deficiency should exist; and if they did exist, naturally a serious objection arises, and, aside from the inference which may be drawn that his opinion of his adversaries is altogether too small, otherwise his argument in its present shape would not have been imposed upon them. We may find a second objection, perhaps more serious than the first. This applies to knowledge concerning the action of coagulants. Dr. Kirk makes no distinction in the action of coagulants, and yet there is a very broad one. Some act in such manner that egg albumen is thoroughly cooked when placed in contact with them; others again but partially. If campho-phénique, or oil of cloves, or oil of cinnamon be brought in contact with egg albumen, we can observe readily that the resultant coagulum is quite different from the one produced with carbolic acid, or zinc chloride deliquesced, or corrosive sublimate used in such strength as will manifest its powerful coagulating quality.

Carbolic acid with egg albumen produces coagulation that is marked. In consistency it resembles the albuminoid part of a hard-boiled egg, being quite as hard and unyielding to touch. Visual test detects very little difference. With campho-phénique and egg albumen, on the other hand, we recognize distinguishing points at once. The coagulum is not as hard nor as unyielding, and compares more with the albuminoid portion of a soft-boiled egg. It presents a soggy appearance in contrast to the coagulum produced with carbolic acid, which appears much more solid. In short, we can say at once, albumen is not cooked as thoroughly in the one case as it is in the other.

Chloride of zinc deliquesced renders egg albumen almost as hard as cartilage. To separate a portion from its mass requires a greater force than that which would be sufficient to detach a portion were we dealing with coagulation from carbolic acid and albumen, while such coagula as result from applications of campho-phénique to albumen of eggs separate into smaller particles readily.

Blows from a smooth instrument leave no impression upon coagula from zinc chloride or carbolic acid, while in the same test with campho-phénique the opposite is the result. Where we impress an instrument so as to produce an indentation in the coagulated mass, in the first case the mass is so resisting that it resumes its original form upon removal of the instrument. These characteristics indicate a thorough cooking process as the result of deliquesced zinc chloride applications to egg albumen.

In contrast to these results we have those where the coagula are produced from the action of oil of cloves or oil of cinnamon upon egg albumen. These coagulants produce very little of the cooking process. The coagulations are flaky throughout, showing less consistency than even those from campho-phénique.

These observations may be confirmed by means of the microscope. Coagulations produced with campho-phénique, oil of cloves, or oil of cinnamon show numerous interstices throughout their mass. Coagulations from the action of carbolic acid discloses very little of any structure, while in such cases where zinc chloride had acted upon albumen, the resultant coagula show still less structure, appearing as a solid mass.

From this we may assume that there is a decided difference in the action of coagulants. But so far this difference exerts little influence. Not until we observe its effect in the treatment of the root-canal, with its possible and probable sequences, do we ascertain that Dr. Kirk, with his principle of osmotic action, is far from the safe

point in the treatment of devitalized teeth. The position taken by him leaves the interpretation that diffusion of liquids takes place in the root-canal even after the use of such coagulants as carbolic acid or zinc chloride, and thus any after-application that may be directed to such canal continues to act upon the principle of diffusion, so that the objection extended by many that the use of coagulants (meaning irritating coagulants) in the canal renders a barrier to any further diffusion is shown to be erroneous. Now, we think we may readily observe that Dr. Kirk's argument is faulty. We found different coagulants act in different degrees as relates to power of coagulation,—the different coagula showing a marked difference in structure. Some were found to be loosely coagulated, others solidly coagulated; and we may find, furthermore, that albumen coagulated solidly, such as results from the action of carbolic acid or zinc chloride, admits of no extended penetration of a second application, unless such application remained in contact in excessive quantity with the coagulum for two days or more. In dental work this is not admissible. Not alone that circumstances very frequently will not permit the excessive quantity being placed in apposition with the root-structure; but, supposing they did, it would be inconvenient and annoying to do so. When to this we add the grave objection, pointed out elsewhere, that under no circumstances could we regulate just sufficient diffusion and coagulation that it would not be liable to irritate the pericemental membrane, we may find that Dr. Kirk not alone has failed to impeach the position of those who do not employ irritating coagulants, such as carbolic acid and zinc chloride in the treatment of the root-canal, but he has called forth fresh objections to the use of such medicaments.

Coagula produced by the action of campho-phénique, oil of cloves, oil of cinnamon, or any coagulants that produce with albuminoid matter simply such coagulations as would present the characteristics of loosely-formed coagula, admit diffusion of a second application that stands in decided contrast to that of hard-formed coagulations. They are of such nature that second applications penetrate throughout their respective masses almost instantly.

Now, from these observations we may conclude, whereas the action of carbolic acid, zinc chloride, or any coagulants which produce with albuminoid matter coagulation, the nature of which renders diffusion of a second application difficult, or retards it to such extent that in dental work we would have little, if any penetration, that such practice is unscientific, to say the least, because of the untoward results that may ensue. And, moreover,



as the use of such coagulants as campho-phénique, oil of cloves, oil of cinnamon, or any coagulants the use of which with albuminoid matter renders the resultant coagula easy to diffusion of any subsequent application, such treatment, to the contrary, is scientific.

There is no need to enter again into the details of the objections that beset Dr. Kirk's argument. The principle of osmotic action in its entire understanding, instead of offering a scientific basis for the use of certain coagulants in canal work, offers a scientific basis against such practice. Its acceptance commits us to alternate difficulties. And, in conclusion, we may add that it seems curious in what manner certain pathological teachings that have been in vogue for the past twenty-five years, in the light of advanced knowledge, assume a scientific aspect heretofore denied them. It has been the accepted procedure with many for years to exclude irritating coagulants from the treatment of devitalized teeth, observation and experience furnishing the basis for the restriction; and to-day these teachings become verified from actual experimentation. Then, again, there is a peculiar coincidence in the fact that the pioneers in this work have been identified with the work that has almost completely revolutionized operative dentistry from the stand-point of filling cavities of decay, giving rise to the *New School*. That work, too, owes its inception to empiricism. But to-day science underlies empiricism. The statements of laws of any scientific knowledge are the statements of laws of scientific dentistry, and thus it advances to the position of a true science.

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## GUTTA-PERCHA AS A FILLING-MATERIAL.<sup>1</sup>

BY ARTHUR H. STODDARD, D.M.D., BOSTON.

It is now many years since J. Foster Flagg announced this "new departure" in filling, and although most of us believe that his ground in the matter is extreme, yet there is an element of truth in his theory which every unprejudiced man should accept.

Most reformers are likely to be extremists, and it is only after the lapse of time that their theories settle to their proper place.

We recognize this in "the mind-cure and other pseudo-science," of which we hear from time to time, and, although we are not prepared to accept the theories as a whole, yet we cannot deny there is an element of truth in them. So it is with the "new departure."

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<sup>1</sup> Read before the Harvard Odontological Society, May 31, 1894.

There are certain cavities and conditions of the teeth where gutta-percha is unquestionably the best, as in other cases it might be the worst, material that could be used in filling. As a temporary filling in treating dead teeth, stopping canals, separating, etc., its value is acknowledged by all. But I wish to call your attention to-night particularly to its value as a permanent stopping. It is no longer a theory, but a fact proved by experience, that I have been able to save many teeth by its use which could not have been saved by any other means. I refer particularly to very frail teeth of persons who, through neglect or improper treatment, have large cavities in the buccal or approximal surfaces of the molars and bicuspids. I may add, however, that in cases where they are subject to the wear of mastication, I almost always cap with oxyphosphate of zinc, but I usually prefer to fill without cutting down from the grinding surface when the cavity can be properly excavated without. Many times shallow cup-shaped approximal cavities without undercut can be filled with gutta percha, when it would be impossible to insert gold or amalgam without cutting away considerable sound dentine.

In cases where I insert cement filling on approximal surfaces, I always build in the cervical wall with gutta-percha. This overcomes the liability to disintegration of the cement. I generally use gutta-percha in approximal surfaces in children's teeth, and sometimes in the fissures in molars, if for any reason cement or tin are excluded. In this manner the teeth can be kept along for years, till they become hard enough for gold or amalgam fillings.

The durability of gutta-percha fillings depends on the kind of gutta-percha. The method of manipulation, the manner of heating, the location in the mouth, the location in tooth, and on the secretions of the mouth. In some mouths the surface of the gutta-percha decomposes to some extent. I recall one case where the surface of the gutta-percha became reddish in color, due no doubt to a fungus growth. When this is removed it remains white but a short time, and then assumes the reddish color again. It is now over three years since I first saw these fillings, and they are still in good condition.

The success of gutta-percha fillings depends greatly on their manipulation. The manner of heating is of the greatest importance. If heated so that it swells or blisters, it is ruined and should be thrown away. It should not be heated in an open flame, as the angles of the pellet become burned while the interior is scarcely warm. I use a metal or soapstone disk high enough above the flame to allow

it to remain at about the necessary temperature for heating the gutta-percha, while the instruments can be heated to best advantage in the open flame, as they should be considerably warmer than the gutta-percha. It is advisable to wipe out the cavity with resin varnish and insert the gutta-percha in small pellets; when a little more than full condense with a warm flat instrument; after having carefully trimmed overhanging edges, smooth with linen tape slightly saturated with oil of cajuput.

The best gutta-percha I have found is "dentrone." It is durable, packs well under a warm instrument, is not elastic, and does not drag, although it requires considerable heat to soften it. Almost all the gutta-percha I have tried, except this, has a tendency to drag from the wall of the cavity unless manipulated with a very warm instrument.

The gutta-percha which I shall pass around I prepare myself, and, although it is intended principally as a temporary filling, yet I use it occasionally as permanent filling in such places as the lingual surfaces of the lower molars. It softens at low heat, packs readily in the cavity, and does not drag; and it becomes quite hard after it has been in the mouth for some time. It is prepared from Knapp's sheet gutta-percha, is cut into strips, and allowed to stand two or three days in a solution of oil of cajuput and chloroform, equal parts. Then it is warmed till it becomes thoroughly soft, and plaster of Paris is added till it becomes about the consistency of putty. It may then be taken into the hands and kneaded thoroughly, rolled into strips, and allowed to remain in the open air till the chloroform and cajuput evaporates, when it is ready for use.

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## Reports of Society Meetings.

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### HARVARD ODONTOLOGICAL SOCIETY.

THE regular monthly meeting of the Harvard Odontological Society was held at Young's Hotel, Boston, on Thursday evening, May 31, 1894, at six o'clock, President Eddy in the chair.

*President Eddy.*—We will open our educational work to-night with a paper by our active member, Dr. Arthur H. Stoddard, on "Gutta-percha as a Filling-Material."

(For Dr. Stoddard's paper, see page 709.)

## DISCUSSION.

*Dr. Bigelow.*—Dr. Stoddard's method of putting in oxyphosphate fillings with gutta-percha at the cervical wall, I think, is a good one,—that is, the gutta-percha does not disintegrate as fast as the oxyphosphate.

The gutta-percha which Dr. Stoddard prepares I have used for a short time. Its working qualities are good. It seems to be dead, in the sense of not curling. The fact of its having incorporated with it the plaster of Paris makes it desirable as a filling-material, and likely to be quite permanent.

I am a thorough believer in the use of gutta-percha where it can be used with probability of success. I believe we can do more good, save more teeth, and keep our patients in a more comfortable condition by a conservative use of the so-called plastics than we can possibly do by relying entirely on metallic fillings. I remember hearing at the Dental School Dr. Briggs advance very strongly the desirability of using the so-called plastics, particularly gutta-percha. I think he made the statement in the school that at the cervical wall he had greater faith in gutta-percha as a preventer of the recurrence of decay than any other material then in use, and I have become converted to about the same idea.

*Dr. Taylor.*—I have nothing to add, but I have a question to ask. Some time ago I placed some white gutta-percha in the front teeth of a girl fifteen years old; in a short time it had turned very black; the effect was unsightly. It was my first experience with such a result, and I would like to know the cause of this change in color.

*Dr. Reilly.*—I don't know that I can answer Dr. Taylor's question, but will relate my own experience. Some five years ago a paper was read before this Society on this same subject, and at that time I related my troubles with gutta-percha taking on a dark surface in a short time. For warming I was then using soapstone over the gas-flame; I have abandoned it since, and for the past two years have used dentron, heating it (as Mr. Owen suggests) directly over the flame only enough to soften it, and I now find no discoloration. There is one thing I can say for the old way, however, that, while it would discolor, it would wear indefinitely. I use the same instruments and same finishing process.

*Dr. Stanley.*—How did you say you heated it?

*Dr. Reilly.*—I use ordinary gas, Bunsen burner, and hold it above the flame, heating it a very little, depending on the balsam

with which the cavity is wiped for adhesion. The pliers take up the heat much faster than the gutta-percha and sink into it when it is warm enough for use. If as much attention be paid to the gutta-percha filling as to gold we shall get better results. I gave up the indiscriminate use of gold fillings ten years ago, and where I put in perhaps three or four a day at that time, now I may do that number in a week.

*Dr. Briggs.*—They are beginning to “out-Herod Herod.” I began to teach in 1880 in the Dental School, and was then a disciple of the use of soft fillings, and am still; in fact, I was spoken of as “Briggs, the soft-fillings crank.” That, of course, was before the practice became established to the extent that it has now. At that time I was using this same dentron, although it was not known by that name. While very anxious to inculcate the use of gutta-percha, I did not recommend it to the exclusion of all other materials, and I think they have now gone to the other extreme, and are using it too much. It has its place, and is a most useful filling-material, but I do think that there is such a thing as using it too freely, forgetting that there comes a time when other things can be used with better results to the patient.

Perhaps, owing to the fact that I have used it probably longer than any one else in this Society, having begun in 1878, I might give my views on the way to use it. I have always found it better by heating it over the flame, for the reason that one is likely to be more careful in that way than with the soapstone. If you burn it, however, it is utterly ruined, and you must take a new piece. Then, again, I consider it a *sine quâ non* to wipe out every cavity with a solution of resin and chloroform,—that is, perhaps, as important as the gutta-percha itself, and if you do not do that the patients do not get its full value.

I would disagree with the writer in the practice of using a solvent for finishing. I think that any solvent disintegrates it, and the filling may not wear as well. Of course, in finishing, it is harder to do it with a warm instrument than it is with the solvent, which cleans things so nicely; but my experience is that it is better to finish it carefully with a warm instrument. The softening of the surface with the solvent admits of the taking up of coloring matter in the mouth, and it will do it with a poor gutta-percha. It is doubtful if you get such a good gutta-percha as this dentron is, except, perhaps, one which you might make in your own laboratory. I do not like to make invidious distinctions be-

tween manufacturers, but the probability is that no other one would ever make it as carefully as that is made. Where it is not so thoroughly prepared it is more liable to disintegrate and undergo fungus growth on the surface; hence the softening and discoloration, and consequent annoyance to yourself and patient.

I am a great believer in its use, and if I did not use it for anything else, I feel that I could not get along very well without it in the filling of root-canals. I know that there has been of late an advocacy of the use of the cements for root-canals, but the idea is with me that if a healthy root-canal is filled thoroughly almost anything will do; if the root-canal, however, is diseased, and you have to be sure that you fill through the apex of the root, you can place gutta-percha up through it without causing any inflammation, and you cannot do that with any other filling-material and be sure that it will not set up an irritation. I have many times cured old fistulæ by filling them with gutta-percha, and I have been so successful, even where the history of the case, extending sometimes over ten or twelve years, has been of chronic abscess, that I am a firm believer in the compatibility of gutta-percha with the soft tissues, which is the great issue in the filling of root-canals.

*Dr. Clifford.*—May I ask Dr. Briggs why he prefers heating it over the flame to the soapstone?

*Dr. Briggs.*—Because, if you place it on the soapstone, it is left there while you are operating, and, if not all used, I doubt if you throw it aside. Over-cooking is just as bad as burning it. The idea is to heat a piece of the right size, and to heat it just enough. I put it near the flame at first and gradually raise it as it warms. As Dr. Reilly says, the pliers sink into it, and you can easily tell when it is warm enough to use. If I see that it gets over-cooked, as it often will, I throw that piece away and take another. In placing it on the soapstone one would be inclined to run into the danger of allowing it to remain there too long.

*Dr. Clifford.*—What kind do you use?

*Dr. Briggs.*—I have used the same kind of gutta-percha since 1878. I was then with Dr. Williams, and this Mr. Owen came into our laboratory about ten or twelve years after that and was taught how to make it, and, I think, perhaps, at my suggestion, he began to make it to sell to others. I am willing to pay him for it, because I know that I could not do it, or have it done,—as I assume he continues to make it,—for any less price. In order to get the best results in the manufacture of gutta-percha one should work with

only a small amount of heat and material; therefore, but a small quantity can be made at a time.

*Dr. Grant.*—I want to ask Dr. Stoddard if he ever found, after keeping his gutta-percha some time, that it grew gradually harder,—that is, where it is made with a solvent and then dried?

*Dr. Stoddard.*—I have noticed it in the mouth. After gutta-percha fillings have been inserted for two or three months and you attempt to take one out, you will find it is quite hard.

*Dr. Grant.*—I asked because I used to try to make gutta-percha, and did make it until I could buy an article which suited me. I was taught how to make it by Dr. Keep, and his great point was to condense it,—that is, to roll or knead it until it cannot be rolled any longer. Where it is made with a solvent I found that it is likely to be a little porous, although, as Dr. Stoddard said, it is very hard. I made some, ten or twelve years ago, that was almost as hard as glass, and I thought then, if I could heat it and place it in the cavity and get it to resume that degree of hardness, I should have almost a perfect filling. You could not get it as hard, it seemed to me, if you put it through a rolling-mill. Looking at this I thought I recognized some features about it that I had seen before.

*Dr. Stoddard.*—I use it principally as a temporary stopping. I made it myself, not from any formula, but from experience. I tried it first by using chloroform, and found that that did not dissolve it thoroughly, and it evaporated too quickly, so that I could not stir in the powder. I then tried the oil of cajuput, which seemed to dissolve it very nicely in connection with the chloroform.

*Dr. Reilly.*—I would like to ask Dr. Stoddard if Mr. Owen suggested the use of any solvent for finishing the surface of his dentron?

*Dr. Stoddard.*—I knew when I made the statement it was likely to meet with opposition. Of course, I have not had so much experience as Dr. Briggs, but I have watched the fillings very carefully with that in view. For several years I did not use a solvent, and I have watched them carefully to see if I could detect any difference between fillings put in under the different conditions, and I cannot see that there is a particle of difference in the wear. I know the theory is that a portion of the surface does disintegrate under the solvent, but practice does not prove it to me as yet.

*Dr. Reilly.*—Do you burnish after that? I ask because I have talked with Mr. Owen to find out if there was not some way to get the filling to show the original surface that he gets on his gutta-

percha. It is quite a fair polish. There might be saving of time if, after using a solvent to cut down the surplus, one could use the burnisher and get a finished, glossy surface. Finishing with the instrument takes a great deal of time. Of course, it is very readily done with the solvent. Perhaps Dr. Stoddard has tried that way?

*Dr. Stoddard.*—I have not used it in just that way. I always use a very little of the solvent, not so much for finishing off the filling as for smoothing the overhanging edges and fragments; I then finish off with an instrument and wipe with a dry tape after I get through.

*Dr. Reilly.*—Your last treatment, then, is a dry tape?

*Dr. Stoddard.*—Yes.

*Dr. Hitchcock.*—On looking over my records in regard to gutta-percha fillings, some four years ago, I found that out of over thirteen hundred there were only two cases that failed,—a result that one could not get with any other filling-material. Since then I have put in perhaps two thousand more. I do not use resin, but dry out the cavity as perfectly as possible. I frequently use a solvent in finishing,—simply a very small pledget of fibrous paper dipped in chloroform, and finally completing with a burnisher. I have had but very few cases of this discoloration, none of them, I think, in the front part of the mouth.

*Dr. Clifford.*—What kind of gutta-percha do you use?

*Dr. Hitchcock.*—In hidden situations I use the pink. This sometimes lasts fifteen to twenty-five years. I have known it to last on the grinding surface for ten years. When it is worn, it is a matter of two or three minutes to remove the outer portion with a bur and place on more. Decay under it is less than under metallic fillings.

*Dr. Werner.*—I am decidedly on the other side; and, after what has been said, I must speak from my point of view. Gutta-percha with me has a very limited place as a filling-material, and when I hear of dentists putting in two thousand and thirteen hundred fillings in a few years, added to what the essayist has said, I should be inclined to laugh were it not for my sympathy with the patients. I would like to know what kind of surfaces they were. Were they approximal and approximo-coronal?

*Dr. Hitchcock.*—All kinds.

*Dr. Werner.*—I would like to see an approximo-coronal surface filled with gutta-percha that would be good for longer than a few months; good for comfort, good for cleanliness, or good for grind-



ing. I am a thorough believer in full contour fillings in all approximo-coronal surfaces, and gutta-percha is not a good substance to fill such cavities with. It is not clean; it will make teeth sensitive, and when pressure comes on it, it cannot remain perfect. I do not want to say too much for fear I should go to the other extreme.

*Dr. Briggs.*—Keep right on,—you are there already.

*Dr. Werner.*—But in my opinion plastic materials, especially gutta-percha, are on the decrease in proportion as we have skilful gold and amalgam operators.

*Dr. Reilly.*—I would like to ask Dr. Werner to define an approximal cavity.

*Dr. Werner.*—An approximo-coronal cavity, such as I refer to, extends from the cervical wall to and including part of the grinding surface. I think to fill such a cavity with gutta-percha is folly.

*Dr. Reilly.*—At any age?

*Dr. Werner.*—As a treatment, I admit it has its advantages.

*Dr. Briggs.*—What is any operation but a treatment?

*Dr. Werner.*—But we have better things that we can use for treatment. By using the cements we obtain a hardening effect, and as long as the cement lasts you have a clean surface and a filling-material that is non-discoloring, non-fungi producing; and when the cement is worn, scrape it away and add more, and you are making your dentine and tooth harder and preparing it for a permanent filling.

*Dr. Reilly.*—Will Dr. Werner please tell us how many fillings he has ever made of dentron in approximal cavities?

*Dr. Werner.*—I think dentron is the best gutta-percha preparation we have. I have used two bottles of it in perhaps six years.

*Dr. Reilly.*—That is not answering my question,—How many approximal cavities have you filled with dentron?

*Dr. Werner.*—I should never fill an approximo-coronal cavity permanently with any kind of gutta-percha.

*Dr. Reilly.*—Have you ever filled an approximal cavity with gutta-percha as a temporary filling?

*Dr. Werner.*—As a treatment, yes. I filled one this afternoon at half-past four—a small cavity in the left superior lateral incisor—with dentron. Neither the patient nor myself had time for a gold filling. That will arrest decay and may possibly last a couple of years; but if I could have made a non-cohesive gold filling, and taken perhaps a little more than twice the length of time it took with gutta-percha, it would have lasted much longer.

*Dr. Hitchcock.*—I hope Dr. Werner does not think we would take an approximal cavity involving half the crown and fill that entirely with gutta-percha? In cases which extend over the crown, we expect them to suffer from attrition; but five minutes used in replenishing them makes a filling that will give another three or four years' wear. I have had to take out a large number of gold, amalgam, and cement fillings on account of the continuation of decay. The greater part of those fillings have been replaced with gutta-percha with few instances of recurrences of decay. I had a case this week where, of thirty-seven metallic fillings, nearly all were removed on account of decay and replaced with gutta-percha. From former experience with such cases I expect to find the caries stopped.

*Dr. Briggs.*—I don't want Dr. Werner to go on record as having spoken in a slighting manner of the temporary virtues of soft fillings without asking him how long a time he has put his much-vaunted contour fillings to test,—whether he has practised full contour filling long enough to say that they are more than temporary fillings?

*Dr. Werner.*—Strictly speaking, I suppose all operations on the teeth are temporary; certainly all gutta-percha fillings are. The essentials of what we call a permanent filling consist in a material that will not discolor and that will retain its full contour for a number of months or years. How long will your gutta-percha filling last on the labial, proximal, or grinding surface with a patient who is cleanly, uses the brush, and grinds with the tooth?

*Dr. Hopkins.*—I have one in my mouth that has been there for fifteen years.

*Dr. Werner.*—I have a right to go on record as I choose. I would like to see gold and gutta-percha tested in two cavities of approximo-coronal surfaces. I will fill one with gold, and you who believe so thoroughly in gutta-percha the other,—they shall have the same environment,—and we shall keep a record. We will then see which of the two proves most serviceable to the patient, considering the length of service, comfort, and money paid.

*Dr. Briggs.*—Dr. Werner has not answered my question as to how long his contour fillings have lasted?

*Dr. Werner.*—Ever since I graduated from the Dental School I have been a thorough believer in restoring full contour. I have seen contour operations that have lasted thirty years.

*Dr. Briggs.*—They were not yours, though.

*Dr. Werner.*—I think the gentleman next to me (Dr. Page) has

a contour gold filling in one of his teeth which I put in eighteen years ago. I don't mean to say that gutta-percha should not be used at all; it has its place, and that place with me is very limited. And when you speak of making thirty-seven gutta-percha fillings in one mouth, such seems to me ridiculous. I cannot conceive of such a case in my practice. When an approximo-coronal surface is thoroughly and skilfully restored with gold, you will have comfort and security for ten, fifteen, or twenty years; and when it decays at its weakest place (the cervical wall), then patch it with gutta-percha or alloy. With me it is largely a question of skill in regard to the success of gold fillings, which you say do not prevent decay.

*Dr. Stanley.*—Two things are to be considered in connection with this matter,—first, there is no one material that is the best to use in all places. In many places gutta-percha is infinitely superior to gold; second, even though the best material for a given cavity is used, and used unskilfully, it does not save the tooth. When a soft filling is required, I find I get the best results from a combination of gutta-percha and cement; in many cases gold is not to be compared with it in the saving of teeth. The cement will harden the tooth so that at some future time a gold filling may be placed in.

*Dr. Reilly.*—I think Dr. Werner's statement, that he would like to see any one put in an approximal filling that will last over two or three months, ought not to be allowed to pass. I will place in a filling with Fowler's temporary stopping that will last longer than that.

*Dr. Werner.*—What kind of a contour do you get with such fillings?

*Dr. Reilly.*—I am not looking for contours, I am looking for the salvation of the teeth. I don't care to wedge teeth half an inch apart and build them up with gold to make them look pretty, and then find out my mistake after death of the pulp. Much harm may result from the injudicious use of gold. I am not an extremist on soft fillings; I make use of all the materials, but, as Dr. Stanley says, my best experience has been with combination fillings.

*Dr. Stanley.*—I had a family of children whose teeth were very poor, and I think bad judgment had been exercised in the handling of them. Metallic fillings had been put in,—some gold and some amalgam; these I removed and filled the best I could with gutta-percha, in combination with cement, and sometimes entirely with gutta-percha. There were some small cavities on the crowns of bicuspid, and I used dentron in those places. That was over a

year ago. I have recently seen them, and they show no signs of wear at all. I would just as soon think of filling those teeth with Portland cement as with gold.

Subject passed.

*President Eddy.*—Dr. Werner will show models of a case before and after full contour restoration on molars and bicuspsids.

*Dr. Werner.*—I don't know, Mr. President, after the expression of opinion of some of the gentlemen here to-night that they will be very much interested in seeing this case. They are the models of a case which I expected to have operated upon at the clinic, but I could not get the necessary spreading apart of the two bicuspsids in time. It has been done since, and any one who is interested may see the result. They speak for themselves. Of course, if I had filled those places with gutta-percha, they would not have answered the object that the patient had in coming to the dentist. The patient came to the dentist to have the teeth filled, and to get as much comfort from those teeth as possible. Now these surfaces are restored to full contour, and they are complete. We will keep a record of them and see how long they last.

Adjourned.

HENRY L. UPHAM, D.M.D.,  
*Editor Harvard Odontological Society.*

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## AMERICAN DENTAL ASSOCIATION.

### DENTAL EDUCATION.<sup>1</sup>

DR. LOUIS OTTOFF, chairman of the section, read the report, an abstract of which follows:

No section reports having been made to the Association in 1893, the present report covers a period of two years. During that time the following dental colleges have been established: Atlanta Dental College, Atlanta, Ga.; Birmingham Dental College, Birmingham, Ala.; Ohio Medical University, Department of Dentistry, Columbus, Ohio; University College of Medicine, Department of Dentistry, Richmond, Va.; Marion Sims College of Medicine, Dental Department, St. Louis, Mo.; Tacoma College of Dental Surgery, Tacoma, Wash., and Milwaukee Medical College, School of Dentistry, Mil-

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<sup>1</sup> Portion of discussion of American Dental Association, Old Point Comfort, August, 1894. Copied from *Dental Cosmos*, October number.

waukees, Wis. The following have been discontinued: United States Dental College, and Tooth-Saving Dental College, both of Chicago, leaving forty-four schools in active operation and granting degrees.

The present dental-school system of the United States presents more favorable conditions than at any time in the past, for which the National Association of Dental Faculties is largely responsible, practically all the colleges, whether members of the organization or not, being governed by its rules. During the past ten years the number of dental schools has doubled, and the tendency, under the lax individual laws, each State being a sovereign, is to still increase. If every new college has as its motive the education of students in a more thorough and efficient manner, all encouragement should be given. At present the fad is to establish dental departments in connection with existing medical schools, which is usually an inexpensive way, requiring only the addition of three or four dentists to the Faculty and the setting aside of two rooms in the college building for operative and technical purposes. While it adds revenue to the medical college, it does not usually add to the lustre of the profession. It is not desired to deprecate this condition, for many of the dental schools operated in conjunction with medical colleges are among the best of the country; but there are two hundred and fifty medical colleges in the land, and the addition of a vermiform appendix to each might foster a dangerous disease.

A radical change in the requirements for the admission of students is required. The method in vogue—of allowing each school to judge of the fitness of candidates—is faulty. The section would urge that the degree of Bachelor of Arts or its equivalent, obtained from a reputable university, should be requisite. The next important step which should be taken is the extension of the school-year to nine months, and of the complete course to four school-years.

Referring to the laws recently enacted by various foreign governments excluding graduates from American dental schools, the report maintained that as far as ability to actually benefit those in need of dental services is concerned, the American graduate is not equalled by the product of any foreign dental school in the world. In view of the restrictions placed about American dentists endeavoring to practise in foreign lands, it is only proper that we should demand from foreigners coming as practitioners or students compliance with the rules and customs here, especially a thorough acquaintance with the language; teaching and examinations should be conducted in English only, and credentials presented by foreigners should be closely scrutinized.

The two years have been prolific in papers on dental education. It has been suggested that a dental college cannot do justice to a larger number of students than teachers and demonstrators can come into actual contact with, because the men would not have sufficient actual practice. It would seem, in some instances, that the number of teachers, or at least of the demonstrators, should be increased, while where it is impossible to supply sufficient clinical material the student should be advised to obtain privileges for practical work under the tutelage of practitioners.

As to whether it is advisable for a student to change from one school to another, the disadvantages of changing outweigh the advantages, and the better course would be for the student to select a good school and begin and end his course there.

The habit of undergraduates engaging in practice is an evil which ought to be readily controlled by requiring every student to sign, before being permitted to matriculate, a contract, which legal advice says can be enforced in most of the States, embodying a statement that he has not been for a period of two years engaged or employed or interested in a practice conducted on principles not in accord with the accepted code, and has not violated any dental law during that period; and an agreement to conduct himself according to the code, to obey the dental law, and not engage in practice unlawfully; any violation of the agreement shall entitle the college to erase his name from its records and report its action to the other colleges; that his diploma shall be held during good behavior only, the college having the right to cancel it and remove his name from the list of graduates for conduct not in accordance with true professional ethics.

Such a requirement would attract a better element, and, coupled with the exaction of a high preliminary education referred to, would exert a wholesome influence upon the entire dental fabric of America.

The section could see no advantage in a change of the degree which has been mooted. One of the most important steps in dental education is about to be taken, in the organization of an association by the technical teachers. Dental technics, introduced a few years ago by Dr. G. V. Black, will be an absolute necessity of the dental student's education.

The report referred approvingly to the use of outlines or questions and answers to subjects insufficiently covered by the textbooks; to post-graduate teaching as carried on by some of the colleges and by the Post-Graduate Association. The Universities

of Michigan and Minnesota have established a regular course covering a year for graduates who desire to further improve themselves in any particular branch.

The section regretted that opportunity was not found at the World's Columbian Dental College to take steps looking towards the adoption of a uniform nomenclature.

Adverting to the means of educating the public in dental matters, the report commended a pamphlet gotten out under the auspices of the Isaac Knapp Dental Coterie, of Fort Wayne, Indiana, but it believes the best way to impart this information is by parceling it out in small doses and at frequent intervals, giving a single subject at a time. As a model of the kind of reports the section would be glad to receive from all the dental societies, it presented the report sent in by the Washington City Dental Society, giving an account of its work during the year. A list of the dental books published was presented, with brief comments on some of the more important works, and the report closed with an announcement of the other papers to be presented by the section.

*Dr. Frank Abbott.*—The disposition in all educational institutions connected with dentistry at present is not only to make their teaching more thorough, but to extend the time of work. They are now considering the advisability of extending the courses to four years. In New York State it has been considered better in professional education to begin at the other end; better to prepare a man to receive the professional teaching before he commences to pursue the special studies. The Regents of the University of New York deem this a better plan to secure a high standard than the extending of the qualifications required at the other end of the term of study. We can train a man pretty well in dentistry under the rules now in vogue, but the time is past when any man, no matter what his lack of early educational advantages may be, can expect to attain to the highest there is in dentistry. We now think it is better to have our men thoroughly prepared to receive a professional education at the start.

Dr. W. St. George Elliott was pleased to hear the remarks of Dr. Abbott. It had been his privilege to practise dentistry in nearly all parts of the world; he had been a member of English dental societies for eleven years, and he had been sorry to come to the conclusion that the English, in dental education *per se*, were ahead of us. We are their equals in the technique of dentistry, but not in the breadth of scientific education, which with them is the foundation of the dental student's training.

*Dr. W. H. Morgan.*—The success of the practice of dental surgery depends on tactical skill, and the last speaker seems to minify its importance. You can give a man the full science of medicine, and not raise a suspicion of his being skilled in the practice of dentistry.

Dr. Elliott had favored the four years' course as affording greater opportunities for scientific studies, but he did not in any way underrate the necessity for manual skill.

*Dr. Abbott.*—The better prepared the student is to receive his scientific education, the better professional man he will be.

*Dr. E. A. Bogue.*—In view of the remarks of the last three speakers, perhaps it may be well to call attention to the fact that in Austria the student of dentistry must spend seven years in the study of medicine before he can begin the practice of dentistry; hence, there are no good dentists there.

*Dr. Abbott.*—In that country no man can study medicine until after he has graduated from a literary institution, nor dentistry until after he has received his medical education; so that we would naturally say there are no good dentists there. Time does not count there as here. If a man comes through his studies at the age of forty he thinks he is doing well. Here he comes to the college at eighteen and wants to go to work as soon as he can, and at twenty-one or twenty-three he is ready.

Dr. Crouse thought there was one point which college men would do well to consider, and that was as regards undergraduates practising. It is a fact that one-third of those who study dentistry do not practise after getting their education. Anything that would enable these men to find out their unfitness to practise dentistry before they have spent so many years in its study ought to be encouraged. There should certainly be some way of sifting out the unfit material so that a man who was not suited to become a dentist should not use more than a year in finding it out. Perhaps it might do to let them try practice a little before they graduated.

*Dr. J. Taft.*—Perhaps it would not injure the undergraduate but how about his patients? The difficulty is that before a man has completed his studies he is almost necessarily deficient, especially if he is in a school where they have a graded course. The man ought to have a thorough equipment before he is given a chance to treat disease. It is altogether wrong to encourage this idea of undergraduates practising or attempting to practise. Some would go out and win success, and then they would not go back to



the college to complete their studies, but would go on with their practice. The best course is to give them the best possible equipment before allowing them to go out to practise. To permit them to begin practice before they are qualified not only results in their personal failure, but the influence of that practice is prejudicial to the good name of the profession.

Dr. W. H. Morgan was willing to accept what had been said in the paper with the explanations that had been given. The broader the education, however, the better qualified is the man to help those in his care; but, after all, manipulative skill is the key-stone in the arch of dental ability. There was another point in the paper to which he wished to refer. It put forth the idea that a young man who gets into the wrong way, who enters a "cheap John" establishment, should never be admitted to a dental college. Men make mistakes, and it is easy for a young man to make a mistake and get into an establishment of this sort. When he finds it out and wants to rectify it, we ought to take him by the hand and help him; let him have a chance to recover himself. Again, they say a man ought to be thoroughly qualified before he begins practice. If they mean by this that he should know all he will ever learn about dentistry, he did not believe it possible. The schools ought to be prepared to teach their students sufficient to begin practice intelligently. More than this cannot be expected.

*Dr. Crouse.*—If a student, after one course, takes a position as assistant, does it do him more harm, if he is found incompetent, to tell him so then, than to wait until he has spent another term in a room where there are hundreds of others receiving the same instruction?

*Dr. James Truman.*—There is a practical side to this question under discussion. Where shall the line be drawn as regards preliminary education? He did not wish to be put into the ranks of those who are opposed to a high standard of requirements; but he had become convinced from observation that just in proportion to the extent of his preliminary education is the student defective in technical skill. In a long experience in teaching he had found it impossible to make good technical dentists of students after they reached a certain age. He could, therefore, understand, why it was that in the old countries, where they require the certificate of the gymnasium or the *real schule*, to obtain which takes until the student is twenty to twenty-two years of age, before he can begin his professional studies, and then from five to eight years more must be spent in study,—he could understand why, under these condi-

tions, the manipulative skill of the dentists should not be so high as here. One result of this course has been that in England the dental students, while up in theory, are deficient in practical matters. Now, the question is, Where shall the line be drawn? and he held that until we are prepared to give sufficient qualifications in the common schools to enable the student to comprehend the teaching of the professional studies, the common-school education is where the line should be drawn. We don't want the European standards. What we are after is the making of skilful practical dentists.

*Dr. Abbott.*—The matter of manipulative ability is of the highest importance. Dr. Morgan knew what he was talking about when he suggested that we ought not to keep out the young man who had made the mistake of entering a shyster office. Such a young man frequently, under the right auspices, becomes a shining light because of the manipulative skill he has acquired. What is any professional man good for if he is not a practical man? It is the same with us. The educated dentist without manipulative skill simply wastes his talents because he cannot apply his knowledge. Dr. Truman says that the reason why dentists in Europe are less skilful practically than here is that there they are twenty-four or twenty-five years old before they begin practical work. There is this other reason, that in those countries they lack the genius of manipulation which we have here.

*Dr. E. A. Bogue.*—The genius of manipulation is here because we are a republic, where one man is as good as another, and where practically every one learns to labor with his hands. He himself had the good fortune to be a student in the office of the late Dr. Westcott, and Dr. Westcott's students were taught, first of all, to be mechanics. For two years before they began their studies in college they were taught to use their fingers. He could never forget the things learned there, and he was thankful in his work to-day for the instruction given him then. The school which makes the greatest effort to teach manipulative skill is the one which the experienced dentist selects for the son he intends to train as a dentist.

*Dr. Taft.*—Professor Truman has said that we should draw a line for the study necessary before beginning the dental course. Is that all that is necessary? It would be reasonable to expect that a man claiming to belong to a profession should occupy a respectable position as regards his education. Ten years ago more than one-half the practitioners in dentistry were very defective in their ability to use their native language. It was revealed in their cor-

respondence that there were many who could not write a page which was respectable in its composition. They were not orthographers; they did not possess the ability to construct sentences properly. It is time that this state of things be remedied, and to ask that a reasonable degree of general scholarship shall be possessed by every man who enters into the practice of dentistry. All that is required can be got before the young man is sixteen years of age, and it is not necessary to begin technical study before that time. What is needed is within the reach of every young man in this country, and it ought to be required of them. It is, in fact, a matter which ought to regulate itself. It is not necessary to have what is known by the term thorough culture, although those who have it when they enter college are head and shoulders above those who haven't it. With reference to a knowledge of Latin, which is now required at the entrance examination in some of the colleges, and has been suggested as a requirement in all, it is to be said that we want at least a good knowledge of our own language, and there is no better way to get it than by acquiring a knowledge of those tongues from which it is derived. Up to sixteen or seventeen the student should acquire his general education, which should not interfere with the time which should be devoted to acquiring technical instruction. If the course of training requires the student to go on until he is thirty years old, it is not his previous education, but the crystallization of mind and body which prevents his acquiring manipulative dexterity. Differences in manipulative ability do not depend on degrees of general education.

Dr. John S. Marshall agreed in the main with Dr. Taft's views, but he would go a step further. It stirred his blood to hear members of college faculties get up here and decry the need of a liberal education for dentists. If we are to have a profession of dentists they must have a liberal education, but they must also have medical knowledge. The men who write our text-books are those who have graduated in medicine and then studied dentistry. It is a step backward to oppose a liberal education. Dr. Taft also referred to the lack of general education among dentists. The editor of the *Dental Cosmos* says that what they need is scientific education. If dentists were properly educated these things would not be so. Some one says that we should pay more attention, in the training of dentists, to practical matters than to the theoretical. Dr. Marshall held to the opposite view. The only time for acquiring the theory of dentistry is while the student is at college. He will not spend time upon it after he graduates, but he will get practical skill or he

will be a failure as a dentist. It is a mistake to make too much of the practical side. The English dentist is far ahead of us in the theory of dentistry. It would be a good thing if our young men would go there to acquire their theoretical knowledge.

*Dr. Truman.*—Dr. Taft says the mass of dentists are ignorant. That may be true in the West; it is not true in the East. In his position as editor of a dental journal he is brought into contact with large numbers of dentists, and he does not find them ignorant. The papers which come to him as editor would stand very well, compared with those of medical men.

Dr. Taft replied that he did not say that the dentists were a set of ignoramuses. What he did say was that ten years ago there was a great lack of fundamental knowledge among them; but it is not so to-day, and we want out West to get up equal to our brethren in the East.

Dr. Kulp has always advocated a higher order of education as a preliminary to professional studies, more especially for dentistry. It is an open question how to preserve the faculty for acquiring manipulative skill and still have the necessary general culture engrafted. As bearing upon the point, he has found that the young men who have taken a mechanical course in college, which also strengthens and preserves their literary acquirements while giving them a practical knowledge of the use of tools, are the most teachable, when they come to take up the study of dentistry, of any he has ever had.

Dr. T. T. Moore thinks that the solution of the question of a higher education for dentists will be found in the endowment of the colleges. At least one-third of the men now received as students are not competent, and that is the fault of the colleges, or of the system on which they are conducted. The colleges must live upon the fees, and to get these they must have students, and so they keep these men who are not competent; and so long as these conditions prevail institutions will spring up all over the land. The practical solution of the problem is to endow the colleges. When this is done, and the colleges do not have to depend on fees for the payment of running expenses, the intermediate examinations will show the incompetent men,—that is, those who have not the faculties for the successful practice of dentistry,—and they will be dismissed as in military schools. They ought to be allowed the opportunity as early as possible to choose some other calling. It is not right to keep a man three years in a dental college when he is not competent to become a good dentist.

Dr. H. J. McKellops said that he was one of those unfortunates who commenced at the bottom. He was put into a dissecting-room, where he learned the human system, a knowledge which he had always found useful in the practice of dentistry. Now, does the oculist or the aurist ever look into the mouth to see if the teeth are giving trouble? The colleges could do something to raise the standard of dentistry. They could teach thoroughly, for instance, anatomy, not merely of the part in which practical dentistry is most interested, but every part of it; then the students would know anatomy scientifically. Give him the man who can teach science; but if you give the students a lot of patchwork, what can you expect of them in a scientific way? Because students are not thoroughly taught is the reason why there are so many poor dentists. He could hire any number of dentists he chose, graduates of dental colleges, at ten dollars a week. In order to get the best results in teaching students, we have got to start right. Give the student a chance to learn the finer manipulations; don't give him plastic work and expect him to be an ornament to his profession, but cultivate him so that he can do the best things.

Dr. B. H. Catchings has found that the negroes from the dental school in Nashville are thoroughly up in the literary department of their education. They have a written examination, and their answers to questions are nicely expressed. They are, however, as yet deficient in technique.

One feature which shows the general advancement of educational acquirements among dentists is their social position. It is not so many years ago when their social status was about the same as that of the chiropodist of to-day. That was because of the common lack of literary culture. Now they are beginning to be sought after in positions and relations which require the possession of literary ability.

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#### ACADEMY OF STOMATOLOGY.

THE Academy met at the office of Dr. Darby, 1513 Walnut Street, Philadelphia, October 6, 1894.

The meeting was called to order by the President, Dr. Louis Jack.

The monthly routine business of the Society having been arranged, the essayist of the evening, Dr. M. H. Cryer, was requested

by the President to present his paper, together with the proposed demonstrations.

(For Dr. Cryer's paper, see page 699.)

At the conclusion of the reading a patient was presented, and the operation previously performed explained as follows:

"The patient reported at my dispensary in April with what appeared to be a large alveolo-dental abscess. Upon examination with an exploring needle I found I could penetrate to its full length without striking the bone. She was dismissed for a few days to allow time for consideration. Upon the second visit I made a microscopic examination of a small section of the tumor, and it proved to be a giant-cell sarcoma. Reporting the case to Professor Garretson, surgeon in charge, it was decided that there was but one course to pursue, and that was to remove it as speedily and as thoroughly as possible."

The position of the tumor was then indicated upon the patient present, together with the mode of operating with the various instruments, including the use of the surgical engine. The description was then resumed:

"After consultation with Professor Garretson, who is surgeon in charge, the tumor was removed and the bone made thoroughly smooth with the engine-burs; the finger was passed over it to insure that nothing but healthy bone remained. It is not difficult to distinguish healthy from unhealthy bone by the touch of the instrument.

"When the diseased bone was removed, the parts carefully syringed, and the severe hemorrhage stopped, the parts were packed with iodoform gauze as tightly as possible. The lip was then turned down to its proper position, and three hare-lip pins were placed to hold it in position below the nose, and five or six sutures around the alæ. On the Monday following the upper pin was removed, and on Tuesday the lower pin; on Wednesday the remaining one and a few of the stitches were taken out, and at the same time some of the iodoform gauze. By the following Saturday the balance of the iodoform gauze was removed and the patient was practically well, but was detained a week longer. There is some mutilation, of course, in the mouth, being obliged to sacrifice several teeth, but in other respects no special disfigurement can be observed."

The case was then presented for the examination of the members present.

Dr. Cryer then gave demonstrations on the heads of sheep and human skulls of his method of operating with the new improved

surgical engine, proving very satisfactorily to those present that by its use, with the improved burs, it was far in advance of the old methods, admitting of more thorough work, with greater speed and with less pain and mutilation of parts.

At the conclusion of some further general business the President called for

#### INCIDENTS OF PRACTICE.

Dr. Gaskill referred to a case previously reported and remarked: "For the benefit of those not acquainted with this case, I may repeat that the patient presented about two and a half years ago with a very marked condition of absorption of the tissues of the tooth, evidently proceeding from the pulp without external opening. In time the enamel and dentine were crushed down on the palatine surface. About two years subsequent to this the adjoining central incisor presented the same appearance, exhibiting the pulp through the wall of enamel. I placed the patient under the treatment of iodide of arsenic and Fellows' hypophosphites, at the suggestion of Dr. Kirk, with excellent results, as there is now a deposition of dentine in the enlarged pulp-chamber, mainly obliterating the spot on the labial wall. It is still evident, but greatly reduced. The patient reports periodically for examination.

Dr. Truman stated that he had recently received a paper of much interest from Dr. White, of New Mexico, on the use of antiseptics, and accompanying this was sent a sample of balsam, called by the natives "balsamo del deserto." The full description of this new agent will be found in the present number of the *INTERNATIONAL DENTAL JOURNAL*.

The success which had attended the use of this for several years in the filling of root-canals had led Dr. White to regard it of great value, and he had therefore forwarded several samples with the request that it might be tested more generally, in the hope that his conclusions as to its value might be confirmed. The time had been too short since these samples had been received to give a practical test, but should Dr. White's conclusions be confirmed, and theoretically there is no reason why they should not be, we may find in this balsam a most valuable addition to the few materials now possessed for this purpose of canal filling, and possibly superior to all of them.

Extracts were read from Dr. White's letters, the main points of which are to be found in his paper.

Dr. Kirk said, "There is one thought that occurs to me. From correspondence and conversation with dentists in tropical and

semitropical countries, I am led to believe that the difficulties met with there are quite different from those we are obliged to overcome here. In other words, pericemental inflammations are much more likely to occur under our climatic conditions, unless the treatment be more thorough than Dr. White has described. With his mode of managing such cases we would certainly have trouble."

Dr. Truman stated that he had no intention of advocating the use of the balsam, but it seemed to him to have a special value, and as it was antiseptic and impervious to moisture and practically indestructible, it appeared as though it might yet fill an important place in our offices. If as represented, it will prove a great boon in the treatment of children's teeth.

Dr. Jack suggested that perhaps much of its value might be ascribed to the oil of cinnamon combined with it, as described by Dr. White.

Dr. Kirk said that there was a great need of a suitable filling for the canals in children's teeth. He thought this substance might prove valuable for this purpose. He mentioned a preparation of Dr. Van Woert, of Brooklyn, N. Y., composed of iodol and oxide of zinc, for a similar purpose.

Dr. Darby introduced some fine pulp-instruments made from piano wire. The temper was such that they could be introduced into the most tortuous canals without danger of breaking. With these he could readily remove the pulp from any canal.

Adjourned.

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## Editorial.

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### SHALL THE ENTRANCE STANDARD BE RAISED?

THE effort to raise the standard of entrance to medical and dental colleges has been the topic of discussion in interested circles for years. The solution of this problem for the United States seems no nearer to-day than at any time within the past two decades. While this is true, the pressure in certain directions for a higher education has become so persistent and powerful that it seems necessary that the question should be discussed more thoroughly than heretofore.



There can be no antagonistic views held in regard to the general proposition that in proportion to an advanced educational training will be the capacity of the individual for further acquirement, but there must be room for disagreement in regard to the measures necessary to reach this desirable condition.

An advance by leaps and bounds is not healthy progress in any line of work or mental growth, and those who become impatient of results and would have the problem solved in resolutions in societies are not wise in their generation, and, if not checked, become stumbling-blocks in the way of real advancement.

At the last meeting of the American Dental Association, and also at that of the National Association of Dental Faculties, the question of a higher standard formed an important topic. From the proceedings of the former are quoted, on another page, the main points of the report of the Section on Education, together with the discussion which followed. The general remarks on the same subject in the Association of Faculties are not reported, but the resolutions introduced last year and laid over for action this, requiring for entrance to the first year physics and Latin, were warmly discussed and at first passed by a bare majority, to be laid on the table at the next session, on a vote of reconsideration.

The feeling manifested at both of these meetings indicates that a large body, perhaps a majority, of the educators of the United States are dissatisfied with the present condition of things, and are anxious for a change. This is encouraging if it be regarded in the light of aspiration after something better, but the possibility of attainment must always be the factor to be considered in any move, whether it be in the individual or in the community.

The Section on Education reported to the American Dental Association that it "would urge that the degree of Bachelor of Arts, or its equivalent, obtained from a reputable university, should be required."

If it were possible to enforce this, the result would doubtless be the practical destruction of every medical and dental school in this part of North America. In this country institutions of learning, classical, scientific, and professional, are not, as a rule, under the control of the government, State or national. Some few of the States have established universities and can regulate the standard, but this is so exceptional as not to be regarded as a factor in the calculation. It would no doubt be an excellent thing to have all educational institutions under the management of the central

government at Washington, as is done in Europe; but are the people of the United States prepared to adopt this? Could it be carried out under the crude conditions of life existing in many sections? The answer, it seems, must be positively in the negative.

Unfortunately for the hopes of those who look forward to the day when the degree of Bachelor of Arts shall be required for entrance to the professions, fewer men holding this degree are entering those of medicine and dentistry to-day than heretofore.

Dr. J. M. Da Costa pointed out in his address before the Howard Medical Alumni Association that the percentage of college graduates in Howard fell from 53.9 in 1884 to 28.2 in 1892, and has been since declining. At the University of Michigan in ten years, from 1882 to 1892, the proportion in the Medical School at Ann Arbor fell from 10.6 to 9.4 per cent. At the University of Pennsylvania the proportion was twenty-six in 1890-91, and fell in three years to twenty per cent. According to the authority quoted, "sixteen medical colleges were last year without a single college-graduate on their rolls."

While this is doubtless true, and to many is a discouraging fact, it does not mean, as it seems to imply, that the large majority, who had not college educations, were illiterate and incapable of professional instruction. The larger proportion of these had higher school training, and when not thus far advanced, it has covered the solid foundation of that of the public schools, which, while not including the languages, furnishes an excellent basis for practical work and theoretical knowledge. It is not to be understood that this statement of fact means an opinion that nothing further is desirable; on the contrary, the writer is anxious for the period to arrive when it will be possible to secure a higher culture; but this condition, in his opinion, has not yet been attained.

When the public schools will begin a training in the languages, including Latin at the ninth year, and continue this, without interruption, to the seventeenth year, the professional schools can advance the present standard with safety to themselves and with justice to the students, and not until then.

Professor Tait, in his remarks on the occasion referred to, states that "ten years ago more than one-half the practitioners in dentistry were very defective in their ability to use their native language." We would hesitate to credit the accuracy of this statement from any other man, but coming from one of his long and wide observation as an educator and journalist, it must be accepted as

true in his experience. It, however, does not accord with the writer's observation of the portion of the dental profession he is familiar with. If, as he further stated, this is "not true to-day," it demonstrates a very satisfactory improvement in the methods of training the rising generation.

It is not possible to reach the statistics of all the dental schools of the United States, but it is interesting to note that in one of the large dental schools of Philadelphia the records show for the past four sessions that sixty-three per cent. entered from the public schools and upon examinations, and that thirty-seven per cent. came from high schools and colleges. Whether this will hold good for all dental colleges in the United States we have no means of determining, but it is assumed the average per cent. will be nearly the same.

Taking this for granted, it implies that if the sixty-three per cent. were deprived of the privilege of entering these schools, it would leave so small a proportion of students that only those institutions supported by government endowments could be sustained. If, then, the law as proposed in the National Association of Dental Faculties be carried out next year, it will either end in the destruction of two-thirds of the colleges or will result in what is far worse, a persistent neglect on the part of schools to carry out its requirements. While some may regard the crippling if not the total destruction of the means of professional education as not a serious evil, we must so regard it in view of the necessities of the extended territory and increasing population of the country.

It must be clear, therefore, that European methods of preliminary training are not yet adapted to the comparatively new conditions here existing, and it must be conceded that the necessity for skilled practitioners overrides that for men of extended culture.

While it may be true in a general way that "differences in manipulative ability do not depend on degrees of general education," it is certainly true that in proportion to the development in a higher classical training is there an equal loss of manipulative ability. This must have been clearly manifested to all dental educators,—certainly so to the writer.

It seems, therefore, that we must wait the slow development of time before we can hope to have a standard equal to our desires, or one that will draw a proper line between the inferior and superior development of the intellectual faculties. That this period will

surely come as a professional standard there can be no doubt, but it can only be by the slow and healthy development common in all advanced civilizations.

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### THE HORACE WELLS ANNIVERSARY CELEBRATION.

UPON another page will be found the circular letter of the committee appointed by the American Dental Association to celebrate the semi-centennial of the discovery of anæsthesia.

The committee have perfected the arrangements, which include two papers to be read, one upon the "History of Anæsthesia," by Professor Fillebrown, of Boston, and one on the "Benefits of Anæsthesia to Mankind," by Professor Garretson, of Philadelphia, to be followed in the evening by a banquet, at which it is presumed many invited guests will be present from the medical profession. The cost of this has been placed at six dollars.

The importance of this occasion cannot be overstated. It means more than a celebration of a mere event, for it emphasizes the fact that at this period fifty years ago was discovered the means to relieve humanity from suffering during prolonged operations, and has, in the advance of years, enabled surgeons to perform operations undreamt of in the period prior to its introduction. More than this, it will positively settle the date and the honor of this important discovery. Fifty years of contention have served to free this disputed question of all difficulties, and the time is now an appropriate one to celebrate the event.

To dentistry this marks an epoch, and should be regarded as such by every man engaged in the work. It is therefore hoped that as many as possible will find it convenient, as well as a duty, to be present to make the occasion an imposing one.

The criticism has been made that something more substantial than a meeting, addresses, and a banquet should mark this period. In this we heartily concur; but it is understood that at the meeting measures will be taken for a more permanent recognition of Dr. Wells's work. This may possibly assume the form of a monument, to be erected in some one of the large cities. It is too early to consider this, but if this be decided upon as the most appropriate form for a memorial to take, Washington should be selected, as it has claims above all other places.

The privilege of contributing to this fund should not be confined to the dentists of the United States, but contributions should be

solicited from the profession of the world. The honor is theirs as much as ours, and in this work there should be no national lines.

There should be no question as to the possibility of raising sufficient funds to build a monument worthy the man and the great service he performed for the alleviation of suffering, and we believe it could speedily be accomplished.

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### A GOOD APPOINTMENT.

DR. EDWARD H. ANGLE, of Minneapolis, has received the appointment of Surgeon to the Great Northern Railroad for the treatment of fractures of the maxillæ. This, as far as we are aware, is the first appointment of the kind by a railroad company, and is worthy of special mention as showing a proper appreciation of the qualification of Dr. Angle for this important service, and also of the superiority of dentists over the general surgeon for this work.

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## Current News.

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### THE HORACE WELLS ANNIVERSARY CELEBRATION.

DEAR DOCTOR,—You are doubtless aware of the action of the American Dental Association at its recent meeting, held at Old Point Comfort, Virginia, with reference to holding a national celebration of the fiftieth anniversary of the discovery of the anæsthetic properties of nitrous oxide, by Dr. Horace Wells.

The committee, by vote of the American Dental Association, was instructed to secure two papers to be read at the celebration. One upon the "History of Anæsthesia," by Professor Thomas Fillebrown, of Boston, and one on the "Benefits of Anæsthesia to Mankind," by Professor James E. Garretson, of Philadelphia.

The committee was further instructed to arrange for a banquet to follow the meeting, at which distinguished speakers shall make appropriate addresses. A full report of the celebration, including the papers and addresses, to be printed and issued as a permanent souvenir of the occasion.

Arrangements have been completed to the extent of securing favorable responses from the essayists named, whose papers are now in course of preparation.

The banquet arrangements are also largely completed. To cover the expenses attending the celebration, the fee for admission to the banquet has been placed at six dollars. It is necessary that the committee shall have ample notice of the number who will be in attendance, in order that places may be provided for all who may desire to attend.

Subscriptions will be invited later for the souvenir volume, at a price sufficient to cover the cost of publication.

The celebration will be held in Philadelphia, on Tuesday, December 11, 1894.

You are cordially invited to participate in this event, which should enlist the enthusiastic support of every member of our profession.

To that end you are requested to send your check, and notify the chairman of the Anæsthesia Committee at the earliest date possible, in order that an official invitation may be sent to you.

It will be proposed at the meeting that subscriptions be invited for a permanent memorial, to take such shape as the meeting shall decide.

Signed,

LOUIS JACK,

E. T. DARBY,

C. N. PEIRCE,

D. N. McQUILLEN,

E. C. KIRK,

S. H. GUILFORD,

WM. CARR,

A. L. NORTHPROP,

H. B. NOBLE,

JAS. McMANUS.

J. D. THOMAS, *Chairman.*

912 WALNUT STREET, PHILADELPHIA.

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### CHANGE OF NAME.

WE are requested to state that "The Oakland Chemical Co." has changed the name of their product from  $H_2O_2$  to the true chemical name, Hydrogen Dioxide.

# THE International Dental Journal.

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No. 12.

## Original Communications.<sup>1</sup>

### THE CAUSATION OF DENTAL EROSION.<sup>2</sup>

BY A. P. BRUBAKER, M.D., D.D.S., PHILADELPHIA.

BEFORE proceeding to offer any facts or arguments relating to the causation or pathology of dental erosion, as it is observed on the labial surfaces of the incisor teeth, permit me to summarize the existing state of knowledge upon this subject. In the minds of most practitioners dental erosion is associated with the presence of an abnormal secretion, acid in character, discharged from some of the labial glands; the secretion bearing to the erosion the relation of cause and effect. This supposition is supported by the fact that if the inner surface of the lip be examined in cases of erosion, the orifices of a number of the labial glands will be found enlarged, the tissues around red and vascular, and upon pressure can be made to exude a thin watery fluid which is distinctly acid in character, as shown by its reaction with blue litmus-paper. It is further supposed that this acid, though secreted constantly, is by some observers regarded as inactive during the day, owing to its neutralization by the alkalies of the saliva, but that, at night in the absence of these alkalies, it exerts a decalcifying or disintegrating action upon the enamel.

<sup>1</sup> The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

<sup>2</sup> Read before the Odontological Society of Pennsylvania, October 13, 1894.

The lips are regarded as accessory agents, mechanically holding the secretion in contact with the teeth during the night and polishing them during the day. The tooth once decalcified falls an easy prey to the mechanical action of the tooth-brush. The various observations and experiments by which this knowledge has been evolved are the common property of the profession, and for which we are mainly indebted to Dr. James Truman<sup>1</sup> and Dr. E. C. Kirk.<sup>2</sup> In 1893, Dr. Safford G. Perry,<sup>3</sup> of New York, from personal experience and from the observations of patients, stated as his opinion that dental erosion is due to an excess of uric acid in the blood, and is to be therefore regarded as an evidence of the gouty diathesis.

According to Dr. Perry, systemic treatment will check the progress of the erosion, so that excavation and filling of the cavity is not always necessary. While the co-existence of these two pathological states is not to be denied, it is difficult to see how uric acid could give rise to a decalcification of the enamel unless it were excreted either by the salivary or mucous glands of the mouth. Dr. Perry, however, states that he has no proofs to offer that uric acid is present in the mouth or that it is this acid which causes the erosion, but he feels justified in asserting that that condition of the nutrition which predisposes to the production of uric acid gives rise to the particular acid of the labial secretion which does cause the erosion without stating what that acid may be.

The problem, therefore, which presents itself has several elements requiring solution. 1. What is the nature of this acid? 2. Is it capable of decalcifying enamel? 3. What is its origin?

The problem is a difficult one, and it is not with the idea of conveying the impression that the writer has solved it that he presents these observations to-night, but rather with the idea that lines of investigation may be suggested which others may pursue with success.

In the interpretation of any pathological condition, the primary essential is a clear conception of the anatomy and physiology of the structures involved, without which no progress can be made. Permit me, therefore, to direct your attention to the glands of the mouth in general and to the glands of the lips in particular. As is well-known, the mouth is abundantly supplied with glands which, in recent years, have received very considerable attention; they

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<sup>1</sup> INTERNATIONAL DENTAL JOURNAL, vol. xiv., No. 4.

<sup>2</sup> Dental Cosmos, vol. xxix. pp. 55, 56.

<sup>3</sup> INTERNATIONAL DENTAL JOURNAL, vol. xiv., No. 4.



have been divided by Professor Heidenhain into two classes, which differ in the chemical composition by their secretion as well as in the microscopical structure of their secreting elements.

The glands of the first class or type secrete a thin watery fluid containing albumen, salts, and a ferment body. They have, in consequence, been termed albuminous glands. To this class belong the parotid, a portion of the submaxillary, and a portion of the glands found in the tongue and in the nose.

The glands of the second class or type secrete a more or less viscid fluid which contains but a small quantity of albumen and salts, but a relatively large quantity of an albuminoid substance termed mucin. These glands have therefore been termed mucous glands. To this class belong a portion of the submaxillary gland, the sublingual, a portion of the glands of the tongue, the glands of the cheeks, palate, pharynx, and lips.

The topographical distribution of the two types of glands has been very carefully studied in man and different classes of animals. According to Podwisotski, the albuminous glands preponderate very markedly in sheep, goats, and polecats; less so in the pig, horse, guinea-pig, fox, dog, hedgehog, and squirrel.

The mucous glands, on the contrary, preponderate considerably in the bat; less so in the armadillo, mole, and cat. Both types of glands are found in equal proportions in men, monkeys, and rats.

For the purpose in view, I will confine my remarks to the labial glands, merely alluding to the fact that all mucous glands in their structure are in all essential respects similar.

If the upper lip be removed from the body of an individual recently dead, and the skin and orbicular muscle be dissected off, the labial glands will come prominently into view. They are found most abundantly in the upper lip. Though arranged quite irregularly, they are more numerous towards the centre, less so at the extremities of the lip. The body of the gland is rounded, about the size of a small shot, and provided with a narrow duct which is sometimes twisted. These glands are held in position by connective tissue, furnished by blood-vessels and supplied with nerves.

A microscopical section of a labial gland shows that, as the main duct passes through the mucous membrane into the submucous tissue, it branches into two or more ducts, which terminate in enlarged alveoli. The wall of the duct is lined by low, granular, nucleated epithelium, which stains readily with carmine. In the beginning of the secretory part of the gland the epithelial cells are changed in character, becoming enlarged, columnar, glassy in

appearance, and, as shown by their less readily staining with carmine, changed in chemical composition.

The function of the mucous gland generally is to secrete a mucous fluid which aids in mastication and deglutition, while that of the labial gland is to lubricate the surfaces of the teeth so as to permit of free and easy movements of the lips in articulation.

The chemical composition of the secretion of the mucous gland was determined some years ago by Bidder and Schmidt. According to these observers this fluid contains water, mucin, and inorganic salts, the chief of which is sodium phosphate, which imparts to the fluid its alkalinity.

Without going into unnecessary details, permit me to present a summary of the process of secretion, as it has been shown to take place in mucous glands in general. The raw material out of which the gland-cells elaborate the characteristic secretion is furnished by the blood-vessels surrounding the gland. As the blood flows through the capillary vessels the plasma passes through the capillary wall into a surrounding space known as the lymph-space. From this space the epithelial cells absorb those specific materials, which are transformed within the cells into mucin. The water and inorganic salts undergo no change apparently. According to the quantity of the blood furnished will be the supply of raw material. Hence during the periods of glandular activity the blood-vessels are enlarged, this enlargement being brought about by the action of vaso-motor nerves. Coincident with this increased blood-supply the gland-cells themselves are stimulated to increased activity by a special class of nerves, which may be termed secretory. As a result of both influences increased secretion immediately takes place. The nerve impulses exciting both blood-vessels and nerves originate in special nerve-centres in the medulla oblongata. These centres, however, may be thrown into activity in two ways. First, from irritation at the periphery and transmitted through sensory nerves; second, by the character of the blood plasma which flows around the centres. With the cessation of the irritation the centres cease to act and the phenomena of secretion subside.

Here, as elsewhere, however, the pathological law holds good, that the existence of a continuous irritation causes permanent dilatation of blood-vessels and hyperæmia, impaired activity of the epithelial cell, and the production of an altered secretion. In the light of this statement, what does the labial gland present for our inspection? Certainly a change from a normal to an abnormal, from a physiological to a pathological state, as shown by the per-

sistent hyperæmia, a secretion altered in viscosity, and changed from an alkaline to an acid reaction.

The questions which now arise are: 1. What is the nature of the acid here present? 2. Is it capable of decalcifying the enamel? 3. What is its origin?

As stated in the beginning of this paper, from the co-existence of dental erosion and gouty manifestations, an impression has become widespread that the acid in question is uric acid, and necessarily an excretion from the blood by the mucous glands. To this interpretation I must express my complete dissent, and for the following reasons:

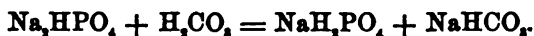
In the first place, it would be a most unusual occurrence physiologically for a mucous gland to take upon itself the excretion of uric acid when the natural excretory organs, the kidneys, are in fair condition. In the second place, uric acid is soluble even in hot water only to the extent of one grain in eighteen hundred,—in other words, to the extent of one grain in four ounces of water. As the quantity of fluid secreted by a few diseased labial glands only amounts to but a few drops in comparison, the amount of uric acid must necessarily be small and insufficient to produce any destructive influence on the enamel. In the third place, uric acid is not, as its name implies, always an acid body. It is considered by chemists as an amphoteric body,—that is, one which is as frequently acid as alkaline, and often neutral. In the fourth place, uric acid is incapable both from its small amount and feeble combining power of decalcifying enamel.

In answer to the first question, it may be said that the acid which is theoretically most likely to be present in the secretion is one derived from its normal constituents. It will be recalled that among the salts there is present in considerable quantity sodium phosphate, a distinctly alkaline salt. One of the peculiarities of this salt is that it readily parts with one atom of its sodium when brought into relation with carbonic acid, when it becomes the well-known acid sodic phosphate.<sup>1</sup> The source of the CO<sub>2</sub> must be sought for in the metabolism of the gland-cells. In the normal activity of the glands the CO<sub>2</sub> produced appears to be insufficient

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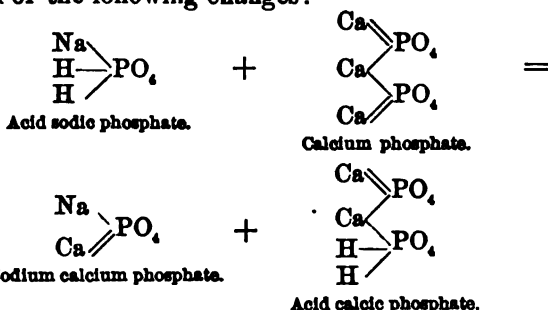
<sup>1</sup> Since writing this paper, my attention has been called to an editorial in the *Dental Cosmos*, June, 1894, by Dr. E. C. Kirk, on "The Oral Manifestations of Lithæmia." At the close of this editorial the writer states that the deposition of uric acid in or around the labial gland "might by its irritant action bring about an alteration of function of the gland which would cause it to secrete an acid mucus, the acidity of which would be due to some other substance than uric acid,—the acid sodium phosphate, for example."

in amount to bring about this conversion. But with increased vascularity and, in consequence, heightened cell activity, the production of  $\text{CO}_2$  must be very considerably increased. Under such circumstances it is easy to see that it might combine with all the sodium phosphate with the production of the acid salt. The reaction would be as follows:

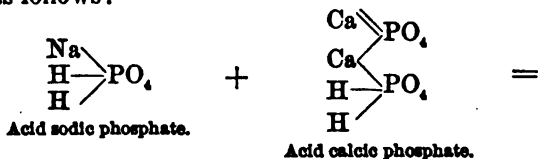


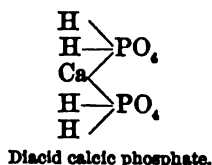
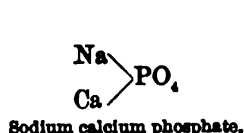
The presence of this acid, it must be confessed, has not been demonstrated, inasmuch as there are no known tests by which it can be detected when dealing with such small amounts. In looking at the list of organic acids which are capable of decalcifying enamel, this is the only one which apparently could come from a mucous gland.

Assuming for the moment that the acid present in the secretion is the acid sodic phosphate, the next question is, Can it decalcify enamel? The possibility of such a capacity is apparent from an examination of the following changes:



When a molecule of the acid sodic phosphate is brought into relation with a molecule of calcium phosphate, a double decomposition takes place. On the one hand, one atom of the calcium displaces the two atoms of hydrogen, thus forming a compound known as sodium calcium phosphate,—an insoluble body. On the other hand, the two displaced atoms of hydrogen replace the calcium atoms in the calcium phosphate, thus forming in the enamel the acid calcic phosphate, which is more soluble than the original calcium phosphate. With the appearance now of a new molecule of the acid sodic phosphate from the gland, a further decomposition takes place as follows:





Once again the calcium atom of the newly-formed acid calcic phosphate is replaced by the hydrogen atoms, with the formation of the old superphosphate or the diacid calcic phosphate, which is very soluble. While the calcium atom combines with sodium and phosphoric acid atoms, and forms the sodium-calcium phosphate.

In this way it becomes conceivable how one by one the molecules of the calcium phosphate of the tooth are gradually disintegrated by being converted first into the mono and secondly into the diacid calcic phosphate.

To convert this theoretical possibility into an actuality I immersed the enamel of a tooth in a weak solution of the acid sodium phosphate, prepared for me by Professor Leffman. At the end of a week the tooth showed two small eroded spots and a number of transverse furrows due to the action of a tooth-brush which was used daily. In addition, the cutting-edges of the tooth show a distinctly eroded character. This simple test may not be very conclusive, but it must be remembered that it is difficult to realize the conditions as they present themselves in the mouth,—namely, a uniform temperature, continuous action, possibly for many months, continued action of the lips, the vitality of the tooth, etc.

In conclusion, I would like to suggest a method of treatment which might be of some value. Even admitting that the underlying cause is the presence of uric acid in the blood, and that the discharge of acid and the subsequent erosion can be arrested by an anti-gout treatment, it is, nevertheless, well known that with a return of the gouty condition there will be a re-establishment of the gland disturbance. Now if the gland, which is the immediate cause of the acid secretion, were removed, even though the gouty phenomena returned, there could be no further discharge of the secretion.

It has occurred to me that the diseased gland can be removed or destroyed by electrolysis, the method employed by the electro-surgeon for the removal of superfluous hairs. These practitioners employ for this purpose a small battery of cells, either the fluid bi-chromate of potassium or dry chloride of silver cells. The *negative* pole of the battery is provided with a fine platinum wire, which is

carefully inserted into the hair-follicle. The *positive* pole is provided with a sponge electrode, which is placed in a small bowl of water. When the needle is carefully adjusted, the patient inserts two fingers in the water. After the lapse of a minute or two a white froth makes its appearance around the mouth of the follicle, which is an indication that the gland-cells have undergone decomposition. The hair can then be readily extracted. After this destruction of the follicle no hair will ever grow.

Now, if this same method were applied to the labial gland in the same way, their decomposition could be brought about with a total cessation in the discharge of any secretion. The lips could be easily everted, and by employing a bent electrode the orifice of the gland could be easily penetrated.

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## THE LABORATORY METHOD IN DENTAL EDUCATION.<sup>1</sup>

BY EDWARD C. KIRK, D.D.S., PHILADELPHIA.

PROBABLY in no other period of a similar extent, in the history of dentistry, has more active progress in all its departments been made than in the past fifteen years. The greatest advances in dental pathology and bacteriology have been among the fruits of dental progress of this period, giving us the solution of the etiology of dental caries, and possibly of that other *bête noire* of the dental practitioner, pyorrhœa alveolaris. This period has also witnessed the renaissance of dental mechanical art as manifested in modern crown- and bridge-work, with its increased and more accurate knowledge of the physical and chemical properties of the metals and alloys employed in the work. There has been a no less important advance in the therapeutic treatment of pulpless teeth, and a similar increase in our knowledge of the uses of filling-materials, especially in the domain of plastics, with a corresponding improvement in their composition. To the same period belongs also the application of cocaine as a local anæsthetic, with its marked impress upon various operative procedures; the introduction of hydrogen dioxide as an oral and dental antiseptic, as well as of numerous other and valuable therapeutic agents, each of which has added its quota towards the betterment of dental methods. As

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<sup>1</sup> Read before the American Academy of Dental Science, Boston, May 2, 1894.

a necessary and correlated factor of this energetic advance in dental science and art, there has been a well-marked activity along the channels of dental educational effort. In the matter of dental educational methods the quality of the product is as with more material processes, largely governed by the forces of public requirement. A dental graduate, discovering that the educational equipment furnished him by his Alma Mater is inadequate to enable him to successfully meet the requirements of actual practice, brings his influence to bear upon the sources of dental training with a view to their improvement to the extent of correcting the defects which he has recognized in them. Hence it is that a wholesome attrition is maintained on the one hand between the profession, through individual effort, in its periodical literature, and by means of its representative State examining boards, and the dental educational institutions on the other, whereby there results a constant and steady improvement in our educational system. The most notable improvements in this respect have been the lengthening of the term of pupilage and the broadening of the curriculum to include a greater range of topics.

These advances are of acknowledged importance and value. They were so palpably needed and so generally admitted to be necessary that no argument is required to enforce the wisdom of their adoption. There is, however, another advance step which has already been taken by a few colleges, regarding which the same unanimity is not evident,—viz., a radical departure from the old didactic and class method of imparting instruction, and the substitution in its place of the laboratory and individual method of teaching. It is this latter method that I shall ask you to consider with me this evening. The question involved is one of pedagogics, and embraces principles which are by no means new, the only element of novelty in the case being the adaptation of certain well-known educational principles to the special requirements of the dental student. All methods of imparting instruction may be broadly classified under two principal systems,—viz., those wherein the student receives his knowledge at first hand by direct sense impressions derived from material objects or phenomena, and those wherein he acquires his knowledge second-hand from mental impressions conveyed orally by the teacher. Fortunately for our purpose, the history of modern dentistry is comprised practically within the allotted limits of a human life, and it is therefore an easy matter to find among its practitioners to-day men whose educational equipment will represent the result of each of the various systems that have in the course of

time been tried. In its earlier history, before the establishment of dental schools, the apprentice system was the only means by which the dental student could gain a knowledge of his calling. Under this system, while it was necessarily varied by individual circumstances, and the amount of instruction imparted depended exclusively upon the ability and the intelligence of the teacher, still the system had one most excellent feature in that it brought the student into close personal relations with his instructor,—made him a witness of, as well as a participant in, the operative procedures of the office, and an active agent in all the dental laboratory work. Under the apprentice system the student listened to no lectures filled with technicalities which he could not understand; nor was the practical part of his instruction confided to demonstrators of recent graduation and little experience. What teaching he received may have been limited as to breadth and extent, but as far as it went it was thorough, for it was obtained first hand and directly from the objects and phenomena with which he was called upon to deal. As evidence that the old apprentice system bore good fruit, it is only necessary to recall to your minds the army of pioneer practitioners who by their ability and wisdom laid broadly and well the foundations upon which the fair structure of modern dentistry has been reared. The demand for a more liberal education for the dentist brought into existence the dental college, which, following the example of its medical ancestor, introduced the lecture system, with its accompaniment of large classes, its amphitheatre, and professorial oratory, to all of which the student submitted as to the inevitable, and, after securing his diploma, gained a large part of the actual working knowledge of dental procedures—which he failed to obtain in college—on the unfortunate patients who consulted him during the first years of his practice. It is true that the mechanical laboratory and operative clinic were designed to supply to the student his needed practical training. This in a measure they do, but as usually conducted the system is handicapped by two serious defects, the first of which is the lack of trained and competent teachers, whose entire time and energy are utilized for educational ends; and, second, the lack of a graded system of laboratory teaching adapted to the rate of educational progress which the average student should make. Until recently, the usual system, if it can be so termed, was for the student to have assigned to him a patient, the care of whose case he attempted to carry out under the supervision of the demonstrator, quite regardless of the nature of the treatment needed and the student's competency to proceed with it. I dis-



tinently recall that during the first day of my attendance at college I was assigned a patient for the extraction of a molar tooth, and, having had no instruction upon the subject, in fact, never having seen the operation performed, I was inclined to rebel; but upon the assurance of the demonstrator that there was no other way to learn, I made the attempt, and succeeded in breaking off the tooth level with the gum, leaving a throbbing, pulsating fragment of pulp exposed in its centre. My subsequent attempt to remove the root failed, because, in my awkwardness, the cold beak of the forceps came in contact with the exposed pulp, giving the patient such a sudden shock of pain that he jumped from the chair and incontinently fled. My experience in putting in my first gold filling was quite analogous to my extracting case, as I managed to drill into the pulp in making my anchorages. I, of course, learned after a time to avoid these disastrous features in my work, but if a proper system of instruction had at that time been in vogue, they could have been avoided from the beginning. My own experience, as indicated by the incidents related, was by no means unusual, and all present can no doubt recall similar ones as having occurred during their college career. A system of dental education which permits the green student to acquire his training upon patients, even those of the dental clinic, is inherently bad and little short of malpractice. But quite apart from the moral and humanitarian questions which it involves, such a system is defective, because it does not admit of graded instruction and training, progressing from the simple to the more complex procedures. The knowledge so gained is likely to be imperfect because of this and lacking in homogeneity.

The modelling of the dental course upon the classical pattern furnished us by the medical colleges, while it has in some ways been productive of good results, has at the same time burdened us with a certain lack of originality and a feeling of dependence that have hampered progress in dental educational methods. Recently, dental teachers seem to be awakening to the fact that the operative procedures of dentistry demand especial and more careful consideration than heretofore; and that better methods are needed for the training of students in the practical manipulative phase of their work. It is being felt more and more strongly that the training required to properly fit a man for the practice of dentistry is a peculiar one, and requires a curriculum adapted to that end. It has come to be recognized that no amount of didactic instruction can impart manipulative skill or dexterity to the student; and that it

is as much a function of the college course to furnish this element as it is to impart intellectual training. It has been found by careful test and observation that intelligent laboratory training means for the student something more than dexterity and manipulative skill. Wherever it has been applied as an educational means, manual training has resulted in an increased intellectual status, a brain cultivation fully the equivalent of the manual dexterity which is incident to it. In fact, the mental development which in nearly all cases has been seen to occur as a corollary of the manual-training method has led a number of practical educators to regard the specific manual training factor as merely incidental to its possibilities as a developer of the intellect; the training of the hand, as it were, being regarded as a means solely for the cultivation of the brain. The importance of this fact and its demonstrated value as an educational means have led to its systematic introduction as one of the factors in the public school system of this country. In several countries of Europe it has already been in operation for some years. Dental educators are coming to recognize the value of the facts as noted, and there is a growing tendency to adapt and utilize them in the training of dental students. Hence it is that the laboratory and clinic-room are beginning to take on a more important significance. Instead of being regarded as workshops, where the student is to put into practice the instruction he has received in lectures, they are becoming the arenas where instruction is given in the presence of the case, and the didactic phase is being correspondingly modified to deal with the scientific principles involved, and the methods of study to be pursued in the laboratory and clinic. The laboratory method of teaching may be taken to include all methods which bring the student into contact with objects or phenomena, in such a way that he can acquire a knowledge of them through or by means of the impressions which they make upon his several senses. Its intrinsic superiority over the didactic method is easily seen, when we consider that in the one case the student is the observer, and receives his impressions directly from the object or phenomenon, while in the other his concept is produced through an association of ideas conveyed by the words of his teacher, who may or may not have been an original observer. The distinction here made is not by any means new; in fact, it would be difficult to name its originator, but it has repeatedly received new impetus, so far as its practical application is concerned, by the work of a number of philosophic thinkers, who, recognizing its importance as a factor in educational processes, have elaborated it in connection with various channels of

intellectual progress. Educational experiments, with the remarkable results achieved in special cases by Pestalozzi, and the writings of Rousseau are in evidence of the value of this method of instruction. The application of the method by Seguin to the training of idiots was a peculiar demonstration of its merit. A more familiar example is furnished by the work of Friedrich Froebel, the originator of the kindergarten system, which is founded upon the same principle. Or again, the laboratory method, as applied in the teaching of all departments of natural and physical science, of which anatomy, physiology, bacteriology, pathology, etc., are to us familiar examples, will show the practical working of the principle under consideration. These again furnish all the precedent that may be required for its adaptation to the needs of the dental student. In 1890, I called attention to this subject in a paper on "The Manual-Training Idea in Dental Education;" emphasizing its importance, not only because of the rational physiological basis of the method, but because under such a system the facts are directly impressed upon the mind of the student with at least a minimum, if any, of mental effort upon his part, and the impressions so made are relatively permanent. No definite plan was proposed for the utilization of the method in dental instruction, the discussion of the psychological side of the subject being the point at issue. About this time or previous to it, Dr. G. V. Black had elaborated and put into successful operation a plan of instruction for his students, adapted to both mechanical and operative dentistry. These he has termed "Technic Courses," and they are based wholly upon the laboratory method. I have had the opportunity of witnessing the practical workings of the method in at least two dental colleges, and any one who has had the same opportunity will, I am quite sure, pardon my enthusiasm in speaking of it. It is but just to its originator, and those who are engaged in developing it, to state that the technic system of dental instruction is still in its formative stage, and that it is being carefully and gradually, though steadily, elaborated, as experience leads to a clearer knowledge of how best to apply it to the mutual advantage of student and instructor. Under the technic system the untrained freshman is not permitted to gain his experience and manual dexterity upon the clinical patient, as under the old system, but enters upon a practical laboratory study of the organs which he will afterwards be called upon to treat in the mouth. He is made familiar with the morphology of the several classes of teeth by actual study of extracted specimens; he is taught to select, classify, arrange, and articulate them in their proper order

and relationship; he studies their structure and the arrangement of their several tissues by dissecting them, just as he does the anatomy of the body in general, which is only properly learned by dissection. The system of dental dissection pursued consists in making sections of the teeth in the vertical axis both laterally and antero-posteriorly; also cross-sections through three or more planes of the crown and root. As each section is made, a record of it is taken by inking the cut surface of the tooth on an ink pad, and then pressing it on paper, which gives a printed silhouette representation of the section as cut. In crown sections a line between the enamel cap and dentine, at the position of the stratum granulosum, is cut out by means of a graver, and a similar line is cut between the cement and the dentine of the root. An impression from a section so made gives a fair though rough definition of the various structures of the tooth as severally related. Besides the knowledge gained by the student as to the relations of the tooth-tissues, and especially of the size, conformation, and general relations of the pulp-chamber, he has by this time gained a very fair knowledge of the texture and physical properties of the several dental tissues, and a definite amount of manipulative skill in cutting them. This is further enhanced by an extension of his study, by the same methods, to the treatment and filling of cavities. An assortment of carious teeth having a variety of cavities is furnished to the student; after he has properly arranged and mounted these in a suitable support, he is taught to prepare, treat, and fill them. He is instructed in the proper use of chisels, excavators, nerve instruments, pluggers, etc.; he studies the lines of enamel cleavage, the formation of anchorages, and how to prepare his cavities upon correct mechanical principles, and is familiarized with the relations of cavities to the pulp-chamber. He becomes acquainted with the physical properties of his filling-materials and their proper manipulation. He is taught to look for and recognize pulp exposure, and what to do in that event. He practically treats his "dummy patient" for all the dental diseases which ordinarily occur,—caries, pulp-capping, pulp-devitalization, alveolar abscess, pyorrhœa, etc. Of all his work he makes a permanent record, which is examined, passed upon, and proper credit given therefor by his instructor. All of this, let it not be forgotten, has to be gone through with before the student is permitted to operate for a clinical patient. Is it not evident that the possibilities of such a system are, beyond all comparison, superior to the plan of turning a class of untrained students into a clinic-room to shift for themselves, with an occasional suggestion from an overworked demonstrator?

The same general method of training is carried out with respect to the department of prosthetic dentistry. The student pursues a course of practical laboratory work, starting out with the simplest and most elementary work, which gives him a familiarity with the materials with which he has to deal. From this he proceeds by degrees to the more complex operations that depend for their successful issue upon his practical knowledge of the principles involved in the assemblage and proper co-ordination of the simpler facts which he has previously learned. The technic system, or, as I prefer for the present to term it, the laboratory method, is being extended to other departments of dental instruction besides those noted. I have recently received from a prominent teacher the syllabus of his course on dental metallurgy, which is based on the same idea. Chemistry, which at one time was taught almost exclusively by the laboratory method, until there arose a tendency to indulge to extremes in the didactic and theoretical method of teaching, has more recently tended to revert to its proper environment, the chemical laboratory; so that the student is now being taught more of the actual facts of the science, and is less likely to be asphyxiated by a flood of formulæ and chemical mathematics than formerly. The same may be perhaps asserted of electricity, if one may take as an indication a statement constituting the preface of an important work on the subject, that "there are but two kinds of electricity, one found on college black-boards, and the other found in nature; this book treats of the latter."

Nature is the best instructor, and it is a closer contact with nature which we need in the study of dentistry; the function of dental educators, in fact, all educators, being, as the term really implies, to serve as intelligent guides in the interpretation of the phenomena which nature in her own way presents for our study and enlightenment. The technic system of dental instruction has its opponents as do all advances of human intelligence, but the criticisms which have been made upon it are those respecting its details rather than of its governing fundamental principles. These latter require no defence, as when fully comprehended they become self-evident truths. Their adaptation, so far as dentistry is concerned, is but recent, and as the initial stages of such movements in all cases require subsequent modification, so necessarily will the technic system, as experience shall more clearly indicate its shortcomings. What we need, then, in view of the growing popularity of the laboratory system, is to clearly understand the principles upon which it is founded, and to develop it in its detailed application to dental

education, so that its highest possibilities for good may be realized. This, in the first place, means the education and training of teachers along the lines indicated. Professors may be had for the asking, but expert teachers are a rarity. We need less of the amphitheatre, with its oratory and rhetoric, and more of class-room, laboratory, and seminar work conducted in contact with dental material, by the aid of syllabus, paper and pencil, instruments, and appliances, all under the guidance of *teachers of dentistry*. The geniuses in science and art are those who, without exception, have received their instruction from nature and her phenomena, as manifested in their several departments. They have, by giving intelligent heed to her teachings, learned, each in his degree, to understand her language and interpret it to others. Because of their ability to translate something of the unknown into terms of the known, the world has called them great. It is the broad principle contained in this truth, which I ask you to consider in relation to the education of men preparing for the pursuit of our calling, to the end that her standard-bearers of the future may be worthy of their high trust.

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#### SOME DETAILS AS TO THE CARE OF DENTAL INSTRUMENTS.<sup>1</sup>

BY WILLIAM H. POTTER, D.M.D., BOSTON.

It has always been my conviction that dental instruments should be as carefully cleansed and sterilized as are the instruments of the general surgeon. When but a student in dentistry, the prevalent disregard paid to the cleansing of instruments was a matter of surprise. I realized that dentists had dealings with infectious diseases of grave import, and yet I saw little concern among operators to make their instruments safe, as they were passed from mouth to mouth. And thus I was led to give the matter of the sterilization of dental instruments special study.

And here let me say, that I do not now propose to argue as to the desirability or necessity of sterilized instruments. I take that for granted, and believe that any one who will give the subject intelligent consideration will reach the same conclusion.

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<sup>1</sup> Read before the Harvard Odontological Society, May 26, 1894.

During my first years of practice, I cared for my instruments in a manner resembling that which I saw in use at the hospitals of this city. There carbolic acid was the main reliance, in strength one to twenty. Following out this method, I used to wash my instruments as thoroughly as possible, and immerse them in a five per cent. carbolic acid solution. But rust would occur from prolonged immersion; and I considered prolonged immersion necessary for real germicidal effects. After using a five-per-cent. carbolic acid solution for several years, I changed to a ninety-five-per-cent. solution. This because of its more rapid germicidal effect, and because steel instruments could be long exposed to its influence without rusting.

By an arrangement of suitable trays I was enabled to handle my instruments without exposing my hands to the caustic effect of the acid. In connection with this process, I always associated to a considerable extent the use of boiling water, either with or without the addition of an alkali. The use of ninety-five-per-cent. carbolic acid, supplemented by the use of boiling water, was my reliance until Dr. Ernst, of the Harvard Medical School, read a paper before the Harvard Odontological Society, on the sterilization of dental instruments, and recommended the use of the Arnold sterilizer. This sterilizer is an exceedingly simple device for keeping a metal chamber at the temperature of 212° F. Articles put into this chamber are subjected to moist heat of such a temperature as to positively destroy any accompanying germs in a definite time. Whereas the germicidal power of carbolic acid or corrosive sublimate (however great it may be) is not as yet definitely determined; the germicidal power of moist heat at a given temperature has been accurately established by laboratory experiment. Following out the suggestion of Dr. Ernst, I provided myself with an Arnold sterilizer, and put it in operation. In the first use, I exposed my instruments to the direct effect of the steam as it was contained in the steam-chamber, and found that the process worked very nicely with such instruments as were protected by nickel plating; but that plain steel instruments were quickly rusted and ruined. I was forced on this account to give up the sterilizer as far as my steel instruments were concerned and return to the use of a ninety-five-per-cent. carbolic acid solution. Having been in the habit, before using the Arnold sterilizer, of boiling steel instruments in a solution of potassic hydrate and thereby sterilizing them without danger of rust, it occurred to me to combine the simple boiling process with the use of the sterilizer. And this was done in the following way: A zinc tray was

made of suitable size to accommodate the instruments to be sterilized, and of proper shape to fit into the steam-chamber. My instruments were placed in this zinc tray and covered with a solution of potassic hydrate. Then the tank was placed in the sterilizer and subjected to the steam temperature for the proper time. The contents of the tank were thus sterilized without rusting steel instruments. Later carbonate of soda was substituted for potassic hydrate, because less expensive and equally effective. In this way I have used the Arnold steam sterilizer for over two years, and with very great satisfaction.

It is, however, difficult to satisfactorily treat certain of our instruments, as, for example, syringes. A syringe having the regulation packing of leather soaked in grease, evidently cannot be subjected to heat of any kind without ruining the packing, and necessitating an entirely new one. And yet how else can such syringes be kept really clean? The greased packing offers so many difficulties in the way of cleanliness that I have abandoned it altogether, except for the hypodermic syringe, and of that I will speak later. For my ordinary piston syringe, such as we use for flushing cavities and the common routine work, I make a packing from the material which composes felt wheels. This packing when touched with a little soap is an excellent substitute for a greased packing, and has this advantage, that it may be put in the sterilizer many times without impairing its usefulness. It cannot be immersed in the soda solution of which I have spoken, but can be exposed openly in the steam-chamber. I do not claim that a syringe with this packing is equal, as a mechanical instrument, to one with the regular greased packing. This more surely than anything else makes a water-tight joint. But I claim for the felt packing that it is cleanly and is sufficiently tight for all ordinary purposes. I might add here that it is my custom to put my syringe through the sterilizer after each use. Another syringe which I believe in is made by tying a rubber bulb, such as comes with a medicine dropper, about a Farrar syringe point. Such a syringe is very useful in the delicate work of treating roots and abscesses, and can be thoroughly cleansed by being taken apart and subjected either to boiling water or the sterilizer. My hypodermic syringe I fit out with a wash leather packing soaked in hot mutton tallow. After use I remove the packing and boil all parts of the syringe in a soda solution, and pack again for further use. My rubber dam straps and holders are sterilized after each use. The only instruments which I cannot readily sterilize are the automatic plugger-engine hand-piece and



the mouth-mirror. Mechanical cleanliness must in the main serve for these instruments.

After instruments have been cleansed and sterilized, it is important that they be properly arranged for work. How can we avoid contaminating our clean instruments with unclean hands while in the midst of an operation? Shall we stop and cleanse the hands before reaching to the case for an instrument? Certainly we should, unless we can approach each instrument individually, without touching those which surround it. If instruments are packed closely in drawers and cases, then either we must laboriously cleanse our hands before approaching our cases, or else operate in an uncleanly manner. My solution of this difficulty is as follows: I provide a table of convenient height and size, cover it with a towel, and lay out upon its surface my working force of instruments. All my small instruments are placed on metal racks, each instrument having room enough about it to be handled without contaminating another. Many of the instruments, such as pliers, scissors, and syringes, are laid out in an orderly way upon the towel. But each instrument is by itself and can be picked up from the table, even with hands right from a patient's mouth, without soiling a neighboring instrument. This arrangement has given me the greatest satisfaction, because it is at once cleanly and rapid. My instruments are all under my hand, and do not have to be sought for in numerous drawers and cases. My operating-bracket consists of a plate of brass having a raised rim. It can be kept cleaner than one made of wood. I do not believe in keeping instruments in an operating-bracket. They are subject to the *débris* of every operation.

In closing, I cannot emphasize too strongly the necessity of having a supply of running water very convenient to the operating chair. It should not be more than five feet away, and not in a closet.

If it is inconveniently placed it will be too seldom used.

The form of faucet which I employ seems to me especially adapted for our work. It is made by cutting off the tops of two high arching faucets, such as are commonly used in china closets, uniting the lower parts with a horizontal tube, and inserting in the middle of this one of the cut-off tops. This gives the hot and cold water mixed from a single orifice, and places the discharge high up in a position most convenient for the hands.

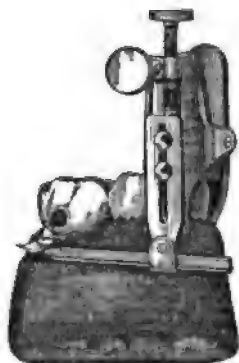
**CERVICAL CAVITIES AND THEIR TREATMENT.<sup>1</sup>****BY WILLIAM L. FISH, D.D.S., NEWARK, N. J.**

**MR. PRESIDENT AND GENTLEMEN,**—The subject of cervical cavities and their treatment, while not one that we would commonly admit was open to argument, has given rise to so many diverse opinions and methods of operating that further discussion may not seem out of place. In dental operations, as in all other operations, there are certain laws of philosophy, and any deviation from these natural laws will be met by signal failure. That they are violated, in both the manufacture of our instruments and our methods of operating, so far as it relates to the class of cavities with which we have to deal, it is the object of this paper to prove. As practitioners we fully realize that of all cavities with which we have to deal those of a cervical character give us most concern, for in them we may achieve our grandest successes or our most dismal failures. We find that one of the greatest drawbacks to success lies in the difficulty of pushing back the gum, a feature simple of itself, yet conducive to the greatest amount of trouble to patient and operator. The first device used for this purpose was the silk ligature held in the hand of the patient. Then we began to have a class of clamps that have given us fairly good results as far as they have gone. But they had all a vital fault. Being constructed in the form of a spring with unequal arms, they seek the smaller diameter when applied to the tooth, and slip either up or down upon the slightest touch. Also, they are absolutely useless in that form of cavity known as compound cervical approximal, where both cavities run into each other. The use of the paper disk is an impossibility. In the treatment of bicuspid and molars we have been sadly handicapped, as these clamps have been poorly adapted to use upon them. One method that I had brought to my attention this summer deserves a passing mention, as it is the invention of one of our Jersey dentists (a fact that I am not very proud of). This eminent D.D.S. stated that he "never used either silk or clamps of any kind. His office being wired for electricity, he simply attached his cautery. and with the loop burnt the gum away to the desired extent." That, gentlemen, is the nearest approach to the sting of a "hornet" that a Jersey dentist has ever attained. Realizing the great need

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<sup>1</sup> Read before the Odontological Society of Pennsylvania, October 18, 1894.

for a clamp of this class that would be as nearly as possible universal in its application, I have endeavored to construct one, intended to be used for cavities of both upper and lower jaw, right or left side, taking in molar teeth. There are in its construction none but purely mechanical and positive principles of action, the gum being pushed back by a simple turning of a thumb-screw, the operation being so gradual as to be almost painless to the patient. The method of attaching the clamp to the tooth next the one to be operated upon leaves the latter clear and free for further manipulations. To better enable those present to understand the workings of the clamp, I have made three section models showing its application to the different teeth. You will see at a glance how readily it can be applied. No. 1 shows its application to a lower bicuspid



of the right side, the receder arm extending back to the molar tooth so that the gum can be readily forced down upon the neck of the tooth. The clamp may be applied to the other side of the mouth by simply reversing the receder arm in the slide. No. 2 shows the application to the lower centrals and laterals. The narrowness of teeth permits of its being applied to the third tooth, thereby giving ample space for work. No. 3 shows the application to upper centrals and laterals.<sup>1</sup> You will observe the receder is capable of being turned so as to allow its use upon small- or large-necked teeth. In filling teeth in the back of the mouth, where the dam is precluded and where the gum bleeds at the slightest touch, you will find this little device to be invaluable.

A great drawback to the successful filling of these cavities lies

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<sup>1</sup> The illustration of the action of this clamp on the molar tooth fully explains the idea, and, therefore, only one is given.—ED.

in the lack of that power of differentiating between the cavity to be filled with gold and that to be filled with plastics. In the case of a gold filling, I would proceed in the following manner: After the usual preliminaries incident to the use of gold, such as applying the dam, clamp, etc., I would proceed to excavate, taking pains to cut well away all soft or defective enamel, even though it may enlarge the cavity to a considerable extent. In so doing endeavor to so shape the same as to have a symmetrical curvature to the entire line of cavity. Do not have a straight base line to a cavity that may extend entirely across the tooth, for the effect will be to make the work look heavy, inasmuch as the oral cavity is made up entirely of curves. I should avoid in every case the use of the retaining point, which is an abomination, a snare, and a delusion, for by its use more bad results are attained than by any other method now in vogue. Not only does the retaining plug transmit thermal shock to the pulp, but sooner or later the poor deluded patient awakes to the sad realization that there is an ache, notwithstanding a filling remains in the tooth. By the use of a slight undercut these results are avoided and a filling produced that will show the encroachment of decay by loosening in cavity. In the making of an undercut it is preferable to use an inverted cone bur that has not too sharp a point. My reason for using this style of instrument is that the larger diameter of cavity is at the absolute bottom. The result being that the gold as it is forced to the walls in the course of manipulation is bound to hug the floor, while in an undercut made by a round bur it will leave the floor of the cavity, from the fact that it is forced to the side walls and will seek the larger diameter; this larger diameter is at a point one-half the diameter of bur-head from bottom of cavity. It is this fact that causes a filling to "ball up," so to speak. After making my undercut I would level the edge of my cavity from within outward, taking pains to make a clear outline free from any flaws, using to make the same a diamond cone point. A bur will be apt to gouge in and cause trouble. This bevelled edge will tend to lessen the tendency to fracture in the enamel margin, during the condensing and finishing process. I now would proceed to line up my entire cavity with absolutely soft gold, packing it around the entire walls and allowing the ends of the cylinders or ribbons to project a trifle outside of the cavity. After lining throughout in this manner, take semi-cohesive gold and work in upon the layer of soft gold by hand pressure with a rotary motion, which will tend to unite and further condense the first layer. In every case use

great care so as not to allow the harder gold to come in contact with the enamel, or allow the instrument to cut through the soft gold. After condensing well I am at liberty to fill in with hard or cohesive gold, and, after a thorough burnishing, finish with any method that may seem most desirable. A filling put in by the foregoing method will be found to stand the test of time. Its very construction making it absolutely tight and the walls and margins free from fracture. In the preparation of a cavity for the reception of any of the soft or plastic fillings, the shape would be the same as that for gold, with the single exception that the bevelled edge should be discarded, and the cavity made as near as possible parallel through the thickness of the enamel. This can best be accomplished by using a right-angled fissure-bur that has the flutes or blades cut on a spiral; the latter form will prevent the bur from chattering, enabling the operator to produce a perfect margin. In the manipulation of alloys I find that the greatest satisfaction is derived from the use of the ball instruments, for the reason that no matter in which direction the pressure is applied it is direct, and the alloy will be found to be more thoroughly condensed than when put in by any other instrument, and the mercury will work to the surface, the ball having the effect of a roller. In finishing be sure and have a surplus of alloy to work down with the burnisher, that little or no mercury may remain in the filling. While the foregoing methods may seem to a casual observer somewhat laborious, a careful study will show that they are based upon certain principles of mechanics which are too often lost sight of in the hurry and worry of a busy professional career.

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## IS PROSTHETIC DENTISTRY LAGGING? NO.<sup>1</sup>

BY WILLIAM H. TRUEMAN, D.D.S., PHILADELPHIA.

"WHILE the reputation of the dental profession in general has been gradually advancing in regard to its knowledge of therapeutics, and in the treatment of oral diseases, together with a still greater advancement in all operations upon the natural teeth, there has not been a corresponding progress in prosthetic dentistry."

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<sup>1</sup> Read at a meeting of the Pennsylvania Association of Dental Surgeons, October 9, 1894.

This statement in the first paragraph of Dr. Broomell's paper, in the October (1894) number of the *INTERNATIONAL DENTAL JOURNAL*, on "*Metallic versus the Plastic Base for Artificial Dentures*," suggests to my mind the above question, and challenges a reply. Confining my remarks closely to this one question, I do not propose to criticise the paper further than to say that it lacks throughout that thorough study and thoughtful sifting of evidence through which scientific conclusions should always be sought. I can justly add, however, that it does so to no greater degree than do the vast majority of articles that make up the general literature of to-day.

We speak of the progress of dental science, and of the relative progress of operative and prosthetic dentistry. Now, let us first fix in our minds what we mean by these expressions. I take it (in brief) that the end and aim of those who practise dentistry is, as far as in their power lies with the means and material at command, to lessen the discomforts suffered by the community in which they live and work, due to the presence or to the absence of the natural teeth. I take it that the progress of dental science is to be judged by its ability to make happier and more pleasant the life of each individual of the community in so far as their pleasure and happiness can be enhanced by dental art. Regarding relative progress, it seems reasonable to assume that the nearer that branch of dentistry chiefly concerned in replacing with artificial substitutes the lost natural teeth approaches perfection,—perfection being that state wherein the artificial fully supplants the natural,—in a corresponding degree will the preservation of the natural teeth become of lessened importance. If it were possible to enjoy the same comfort with a mouth full of artificial teeth, teeth that never decay, never ache, that can be taken out for the purpose of cleansing, and, in case of accident, can be boxed up and sent away for repairs, their place in the mean time being occupied by a duplicate set, who would for a moment longer than absolutely necessary be bothered by the discomforts and ills, and the continual expense of time and money so many sets of natural teeth entail upon their owners, from the moment they appear until they are finally lost?

I presume, however, that nothing is risked in saying that the most skilful practitioner of prosthetic dentistry has not yet reached that point; and that there is much to be done before the ideal perfect set of natural teeth, and the best substitutes our science can produce, will be considered interchangeable. Nevertheless, it is indisputable, there is no question on this point; many natural teeth do not, in their character and structure, in their ability to resist

the destructive tendencies of their surroundings, and in their relation to the general system, closely approach the ideal; indeed, many so far fall short of it that, notwithstanding all that the most advanced in the science of tooth preservation have so far been able to accomplish, there are cases where their loss and replacement by artificial substitutes has materially added to the patient's comfort and well-being. It is also beyond question that such cases are fewer in number to-day than they were half a century ago, and we may reasonably assume that they will be still less numerous half a century hence. All this, however, is beside the question at issue. It simply shows that operative dentistry, while it has not yet reached its ideal, is more and more successfully accomplishing its mission of preserving in comfortable usefulness the natural organs.

Now, then, to the real issue. In the first place, is the dentist of to-day as a mechanical workman less able? Is he less successful in supplying his patients with artificial dentures? Are the artificial teeth of the present time worn with less comfort and satisfaction than were those of— Where shall we fix the date for comparison? Accepting the suggestion of Dr. Broomell, let us say, since the advent of vulcanite. There seems to be an impression among many who speak and write upon this subject that, before the advent of vulcanite, all dentists were experts in the manipulation of the metallic bases which it supplanted. I can imagine nothing further from the truth.

Although there were at that time many skilful workmen who did beautiful work, the average work done was, in my judgment, poor, and to the patient far less useful and comfortable than that of to-day. Dr. Broomell's suggestion that "vulcanized rubber is the nucleus from which sprang dental quackery" is absurd,—amusingly so to a better informed but thoughtless man. To me such expressions are saddening, they are humiliating, they indicate the utter absence of thoughtful preparation among those who pose as exponents of dental thought. Writers of a century and a half ago speak as glibly of dental quacks, and empirical pretenders who cut prices, as do some writers of the present time. Such expressions are saddening in that they most forcibly bring home to us the fact that this calling of ours, masquerading year after year as a liberally learned profession, has utterly failed to provide for its studiously-inclined members such facilities for study which other professions find so necessary and provide so bountifully. Is it possible, can it be true, that there is not in the whole United States, outside of private ownership, *a single dental library worthy of the name?*

I wonder if the author of that expression has ever seen a whole set of artificial teeth on gold or silver base, the plates made to conform to the plaster cast by bending to shape with the pliers and the skilful use of the hammer and bench-anvil, perfectly innocent of any contact with die or counter-die; single gum teeth arranged in place without a touch of the grindstone, and the case, after a rough soldering, passed from the pickel-pot to the mouth with but a few minutes work in the way of smoothing and polishing with a coarse file and sand-paper. I have consigned many such cases to the melting-pot. Talk of filthy vulcanite, more than once, when a laboratory workman, I have been compelled, before handling them, owing to their extreme filthiness, to pass gold or silver repair cases from the box in which they came into a disinfectant, and immediately after, overcome by the noisome odor, have emptied the meal last eaten into the laboratory sink. The condition of the mouths from which those plates came I leave you to imagine.

I presume it is true that the average dentist of to-day is not so well versed as was the average dentist of the fifties and sixties in the manipulation of gold and silver. He may not be able to refine gold and silver, cast it into ingots, and form it into plate. He would probably be completely nonplussed if required to reduce the ingot to plate by forging with hammer on anvil, yet that was the way in which one of my laboratory predecessors *always* made his plates; in his judgment, the rolling-mill was a makeshift for the lazy or the unskilful. By forging alone he produced a plate almost as smooth and of as even thickness as though it had been rolled. The average dentist of to-day may not be able to do as did Dr. Thomas Evans, of Paris, who within a few hours, at night, with the meagre appliances of a country jeweller's shop, transformed a five-franc piece into a silver canula, and thereby prolonged the life of the late German emperor. Dr. Maynard made all his instruments with his own hands except the forging of his extracting forceps, and pitied the dentist unable to do the same. Skilled operators of an earlier date beat out their "joes"<sup>1</sup> with their own hands, and from them made all the gold-foil they used in filling. How many operators of to-day are capable of doing either? Is their inability in these lines any evidence of a degeneracy?

Why should the prosthetic dentist of to-day waste time in ac-

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<sup>1</sup> Joe, a short name commonly used for Johanne, a Portuguese gold coin, value about \$8.64, made of almost pure gold, and on that account preferred by the dentists of that time for making foil.



quiring the art of manipulating gold and silver, an art difficult to learn, and retained only by constant practice, when he feels he can do much better for his patients by using vulcanite? I know thoroughly well all the objections that have been urged against it. I helped to make the record of its vices, but am now free to admit, as was the case with many another so it was with me; when the patent expired and license for its use was no longer required, its many vices dwarfed and its virtues grew. I refer you to an interesting discussion on the subject, reported in the *Dental Cosmos*, vol. vi. (1869), page 80. Much that was there said is as true to-day as it was a quarter of a century ago, and much is very like the stuff found in reports of a more recent date.

Oh, yes, I know all about the ill-made joints of the modern vulcanite plate, the occasional porous rubber, and the rough places that should have been made smooth. Yes, it is true, I admit it, that with some (we will say with many, if you prefer it so) the easy work of making vulcanite plates has engendered careless habits. I admit that the poorly-made vulcanite plate furnishes many a choice spot in which microbes live, increase, grow fat, and run riot; it is equally true that in many gold and silver dentures of a little more than thirty years ago, not only were the joints more numerous, but too often between the teeth and the plate there existed a tunnel through which, with a little "hunching," a cockroach might crawl. Is it backward or forward, this step from cockroaches to microbes?

It is true, the easy-working rubber has given a distaste for the long, tedious, exacting processes by which the skilful workman produced the exquisite artistic finish seen in some of the gold and silver dentures of the past. Many a long and weary day have I spent in rubbing, rubbing, rubbing with Scotch stone and pumice, surfacing gold or silver plates until not a scratch or a dimple could be seen with a watch-maker's glass, and then some two hours or more of pumice and oil, dry rotten-stone, and, finally, rough with brush-wheels at the polishing lathe. After the graver had done its work, a full day was considered none too long a time to finish a full upper or lower denture. Never again will I spend so long a time in such tedious work, until it is the fashion to wear such dentures inside out. So far as practical utility is concerned, the modern felt-wheel will do the work quite as well in one-tenth the time. The finish may not be so artistic, but what of that? It is never seen when in position in the patient's mouth, where it belongs, and the time can be better spent in something more useful. The advent of bridge-work has proved beyond question that there still exists in

the profession quite as much mechanical ability and of as high an order as there ever did. The exquisite work in the plastic bases, artistic and mechanical, exhibited at dental meetings, and so often seen doing efficient work in patients' mouths, testifies alike to the ability of the prosthetic dentist who constructed it, and the capability of the material of which it is made, to respond effectively to well-directed efforts. Were the plastic bases swept out of existence, and the prosthetic dentist of to-day compelled to use the materials available before their introduction, I have no question but that as good work, and as much good work, would be done now as was done then. Such expressions as have called forth this paper are among the stock "fads" constantly used in dental meetings, expressions learned parrot-like one from another, none taking the trouble to examine whether there is anything back of them or not.

That the advent of vulcanite has made less costly artificial dentures, that it has enabled a dentist possessing but little mechanical skill to construct dentures that fit the mouth better, and give the patient more satisfaction than would dentures made of a less manageable material by the same hands, is no evidence of a decline in the prosthetic dental art. This is perfectly in line with that which we term *progress* in other arts and sciences. The substitution of machinery for hand-labor, improved processes, etc., has cheapened food and clothing, has resulted in the community being better fed, better clothed, and more comfortably housed. Many luxuries that a few years ago the wealthy alone could afford have by these means been so reduced in cost that they have become not simply accessible, but so common that they are now recognized necessities among those of limited means. Is it not reasonable to expect that, in time, dentistry, in all its branches, will be added to them? All this, while the producers of these things have easier work, fewer hours of labor, and in many cases are better paid. For from five to eight or ten dollars it is possible to obtain an upper denture on vulcanite far superior in every way to one that would have cost, perhaps, twice as much before vulcanite was known. This has enabled thousands to enjoy the comfort and satisfaction of artificial dentures who thirty or forty years ago would have been constrained, on account of their limited means, to do without them? That it has caused a less value to be set upon the natural teeth by many is also true; but do you not see in this evidence that the prosthetic branch in its service to the community has advanced beyond the operative? Take an average set of natural teeth, such as we are called upon daily to treat in the mouth of a patient, to whom a dollar saved from

actual living expenses means many hours of toil; as operative dentistry is now practised, how far will five, eight, or ten dollars go towards saving those teeth? What is operative dentistry doing to-day towards adapting its methods to meet such cases?<sup>1</sup> That at the Columbian Dental Congress the report of the Committee on the Care of the Teeth of the Poor was read by *title only*, shows very plainly the little interest the profession takes in this important matter. It is an issue, however, that operative dentistry must meet, or fail in its mission. The increased attention given to the plastics, the improvements in material, and in methods of its manipulation, have been steps in the right direction. Dr. W. D. Miller's recent investigations with a view to simplify and render less expensive the treatment of pulp lesions is another step that deserves all the encouragement that can be given to it. The wholesale destruction of good natural teeth is largely due to inability of a vast majority of the community to command or to pay for any other attention. At the present time, as in the past, if we may judge from the reports and papers found in the dental journals, the profession discourages any attempt to meet this condition, stigmatizing as "quacks" those who are willing to work for a price the poor are willing and able to pay, grudging even the little charity work done in the college clinics.

Notwithstanding the prattle heard in our dental gatherings to the contrary, dentistry—prosthetic and operative—is a part and parcel of the world's business, and is governed by the same natural laws that governs every other industrial calling. Over thirty years of practical use has demonstrated vulcanite to be a good base for artificial dentures; its use is world-wide, yet complaints of its evil effects are far less frequent now than they were twenty years ago. Competition has reduced the cost and improved the quality of artificial dentures so that to-day few, if any, for financial reasons, need to do without them. Operative dentistry still remains a luxury the well-to-do alone can afford, and if service to the community be the test, it is not prosthetic dentistry that is lagging in the race.

Operative dentistry so far caters only to the wealthy; expensive methods, expensive materials, alone seems to attract attention. We are urged by one to use more scientific methods, *and charge for them*; by another, to do the very best we can regardless of expense and then *make the patients pay*. You will not have to search far

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<sup>1</sup> Dental Cosmos, vol. xxxv. (1898), page 1051.

among reports of dental meetings to find such like expressions repeatedly used. Would it not be well to have a little thought for those "precious organs" in the mouths of the hewers of wood and drawers of water. At least have a kindly feeling for those fellow-workers, who amid great discouragements are doing their best to teach these poor work-folks how precious they are. Their fees are small, and there is often a long wait between earning and getting; indeed, too often the getting never comes. The dentist who is striving to do his duty with a practice largely composed of working people deserves far more encouragement from his fellows than he usually gets. If you cannot help him, if you cannot point him to better ways that are to him practical, don't ostracize him, don't call him vile names,—a quack, a scalawag, or a scab. Remember he is working for God's poor.

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## Reports of Society Meetings.

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### AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held at Young's Hotel, Wednesday evening, May 2, at six o'clock, President Smith in the chair.

*President Smith.*—Gentlemen, you will remember that at our last meeting Dr. Farlow read a very interesting paper on "Some Relations of Diseases of the Nose and Throat to Dentistry," and exhibited the patient from whom he was about to remove some adenoid growths. That operation has been performed, and Dr. Farlow kindly comes before us to-night to report the case, and to show the specimens.

[Dr. Farlow exhibited the growth which was removed by him, the operation requiring several sittings. A ten-per-cent. solution of cocaine was used. He also presented the instruments which were used in the operation, together with a number of instruments for other operations in the throat and nasal passages. The patient referred to was getting along very nicely.]

I know I express the unanimous sentiment of the Academy when I say, we all feel very grateful to Dr. Farlow for his trouble in presenting this growth, and reporting to us the results of his operations.

It now gives me great pleasure to be able to introduce to you, this evening, a gentleman who is known personally to many of you, and to all of you through his works. I have the honor of presenting Dr. Edward C. Kirk, of Philadelphia, lecturer on Operative Dentistry at the University of Pennsylvania and editor of the *Dental Cosmos*.

*Dr. Kirk.*—I will ask you, gentlemen, to consider the matter which I shall bring before you this evening as suggestive merely. I present it in the hope of stirring up a line of thought which may result in a discussion that shall be of practical value to the profession. The paper is one of the few that I have written, which I feel it necessary to preface with an apology. It was written under great stress for lack of time, and it is for that reason not up to the standard which it should be.

(For Dr. Kirk's paper, see page 746.)

#### DISCUSSION.

*Dr. Fillebrown.*—I should like very much to shake hands with the essayist on this subject; but as the distance is too great between us, I shall have to tender my congratulations by thought transfer. I am heartily in sympathy with his presentation of the subject, and especially so because it embodies thoughts which I have had in mind for a good while, and according to which the Harvard Dental School is now working. I do not ordinarily bring matters of "school" into a society where there are so many different interests, but I think to-night it would be quite pardonable to tell you something of what we are doing and something of how we do it. I believe the same spirit of progress is in all the dental colleges in this part of the country. I, for one, have for a long time believed that manual training is more essential than anything else in the curriculum of the school. The most important thing for a person who has met with an accident, or is suffering intensely with pain resulting from decayed or diseased teeth, is to meet some one who can treat his case practically, and bring about immediate relief, insure the return of health to the organ, and restore the tooth to usefulness. In such cases the ability to do it is much more important than a full knowledge of reasons why it should be done. Still, to make the well-rounded dentist able to worthily maintain a high professional standing and dignity, the intellectual faculties must first of all be well trained. The history of the movement which has been very accurately and clearly elaborated in the paper this evening extends back many years. The original method of dental teaching

was exclusively the laboratory method, and this was considered the only essential feature of dental education, until the schools recognized the fact that a greater intellectual development was necessary, and saw that the scientific side must be magnified. This has been done at the expense of mechanical instruction and practice. In the dental department of Harvard University we have endeavored to elaborate both sides, and to provide for each department competent and practical instructors. Our method at present is to assign to each student the control of an operating chair every day in the year, and our school years are nine months long. This gives every opportunity for practical instruction and practical manipulation to fit for daily practice. Some three years ago we found it possible to adopt a preliminary course which has something of the manual training idea in it, and in which the student receives a thorough drill in the anatomy of the tooth, and performs operations on extracted teeth something after the plan suggested by Professor Weeks. They are obliged to meet a certain standard and do a certain amount of work before they are allowed to take a chair and operate upon a living patient. This has proved eminently successful, and eminently useful for the steady development of the student.

Another idea that we are now discussing, and I hope to see in good working order before long, is a system of manual training for the purpose of increasing the strength of the hand, and developing its mobility, thereby securing greater accuracy of movement. Before long I think students will be expected to show a certain amount of strength, accuracy, and adaptability of the hand, the left as well the right, before they shall attempt operations, even upon extracted teeth. I mentioned that subject two years ago in our Association of Dental Faculties, and some treated the idea with ridicule, thinking it to be unwise and impracticable. Nevertheless, I have the firm belief that this principle lies at the bottom of the education of good operators. I have been in consultation with Professor Fitz, of the Lawrence Scientific School, about what is required to accomplish this, and he is devising an apparatus, practice upon which will develop all the motions of the hand, and also of the arm and shoulder. With this instrument the muscles can be developed, their strength increased, their mobility promoted, thus insuring greater accuracy in every operator upon the teeth. The student having this training will be less likely to let the bur or excavator, or whatever instrument he may be using, go awry. I have the greatest faith in the application to dental education of the idea which has been so fully and nicely elaborated in our paper to-night.

*Dr. Eames.*—I am very much pleased to hear what has been said, the more so, because I am in hearty sympathy with it. I may say that for fifteen years I have been in the habit of using either hand in all operations about the mouth. Being naturally inclined to be left-handed, I found myself in the early part of my practice trying to use the left hand in many operations, and gradually saw some benefits arising from it, and from that onward made it a study, so that I now unconsciously use either hand, standing on either side of the chair. The advantages from this practice are very great.

The method of acquiring dexterity or manipulation with the hands and fingers cannot be better carried out than by operations upon the teeth themselves out of the mouth. It requires, I believe, greater strength to hold a tooth in position while operating upon it in the hand than when it is fixed in the head, and much benefit can be derived from the operations of excavating and filling extracted teeth. This does not lessen in any degree the possibilities of any mechanism that may be devised. In my studies under Professor Da Costa, of Philadelphia, in 1880, I received practical and valuable instruction from the clinical conferences which he established. Different members of the class were invited to make diagnoses of cases, thus giving an opportunity of comparing different thoughts, getting the different views, and correcting the wrong ones, and it seems to me that, in this way, as in no other, can a method be established which will teach the student to make a good diagnosis of the more common troubles coming under the dentist's care, and also the experienced dentist in making the finer differentiation required in obscure dental diseases. For two years past I have been making use of this idea in connection with my classes at the dental school.

*Dr. Brackett.*—I must express my grateful appreciation of the merits of the paper. As I have listened to it there has passed in my mind a review of some of my own personal knowledge and experience in learning, and in teaching dentistry; the methods of dental instruction, and the results of dental education. I am impressed with the thought that I am becoming an old man in that my own experience as student and practitioner lacks only about a year of covering a quarter of a century. I have known something of the old-fashioned laboratory method of instruction, and I have been thinking about the attainments of dental practitioners of a quarter of a century ago in comparison with the attainments of the progressive practitioners of to-day. We may say that it is not fair to make a comparison because the world has made progress, and yet there is

a sense in which a comparison may be made upon the basis of different methods of instruction. The previous generation of dentists began their work from the practical end, as it is called; they approached the treatment of an exposed pulp in the same manner as they did simple dental caries, and the sum total of their knowledge of dental caries, of alveolar abscess, and of the treatment of pyorrhœa alveolaris was derived from this practical experience. The opportunities for general education, cultivation, and comprehensive knowledge attained by the practitioners were very far inferior to those which we at present enjoy; and with the limitations under which they struggled and with the systems of instruction which were pursued, it is not an unjust thing to say that a majority of the men practising dentistry at that time were empirical practitioners. I do not think it is wrong to say that, even as late as 1870, few of the dental practitioners, generally speaking, including the teachers in our schools, recognized marked differences of condition in an exposed pulp. There was but little choice of treatments to be pursued; and it was plainly stated that the results of treatment would be markedly uncertain. There was but little recognition of the pathological differences in the exposed pulp. There was a similar lack of differentiation in various other pathological conditions coming under the care of the dentist, the practitioner getting his knowledge from the practical, rather than from the theoretical side. The treatment was empirical, and not always well founded; it was not nicely adapted to differing pathological conditions, and was successful, therefore, in not nearly so many instances as if accompanied by the best intelligence. I think this is not a particularly slanderous statement of the condition of things that existed a quarter of a century ago, and I think the assignment of the reason that I have given is not altogether wrong.

To some educators of to-day it seems very desirable to begin at the other end and teach foundation principles; teach the students anatomy; teach them the facts of physiology; instruct them in chemistry and the principles of surgery; also the foundation and principles of pathology with especial reference to the oral cavity, and the variety of pathological expressions which such a tissue as the dental pulp may present; teach them such matters as the successive steps of inflammation,—its cause, its development, how it reaches its climax, how it may subside; and taking this as the type of multitudes of other pathological elements, if we wish to so call them, lay a broad foundation, such as shall enable students, when



they come to take up the practical end of it, to do it intelligently, and to make the diagnosis, the finer differentiation, and the course of treatment in accord with foundation principles of which they have already gained a knowledge. As I understand it, speaking not only with reference to the paper, but to the profession generally, there is no contrariety of view to-day as to the necessity of such knowledge. If there are differences of opinion in our minds, it is only in the matter of relative prominence which shall be given to the two methods, and it is granted that the comparison of to-day with twenty-five years past in any particular is not a fair comparison. I do not think that this idea, in such a field as dental pathology, of teaching principles broadly and thoroughly, is a thing that can be by any means left out. I do most cordially agree with the paper that good laboratory methods should be pursued, and I know that when our essayist spoke of laboratory methods he meant the best kind, such as is pursued in our Institute of Technology, that deservedly has the reputation of fitting men well for the active responsibilities of life.

I have spoken thus not in any opposition to the doctrines of the paper, but as wishing to hold up a little of the other end, which I think should be maintained at the same time.

*Dr. L. D. Shepard.*—I wish to extend my thanks for the invitation to be present this evening and listen to the paper of my friend, whom I have regarded for so many years as one of the bright minds of our profession, and as one from whom the most was to be expected. I think the paper we have heard to-night is an ample justification of that opinion, and I have no hesitation in giving it my most thorough approbation and acceptance.

This is to be said of the ancient days: There were teachers and teachers. The majority of young men who thought of entering the profession were taken into the offices for the money which could be got out of them by their labor in the laboratory and about the office, without any serious intention to instruct and to prepare for future usefulness. I think you will grant that to be true. I think you must also grant it to be true that when the competent instructor, recognizing the solemnity of the trust which was put upon him by taking a student, was faithful to that trust, the instruction given was of such a character that as good operators were turned out as have ever been graduated from any of our dental schools,—men whose theory was, perhaps, poor, and whose knowledge was not broad, but who gave as good service to humanity as some of the more cultivated practitioners of later days. Those men live in

my memory, and I have never been given to throwing a slur at any one of them because they did not possess a degree. They were noble men in the profession, and we all—certainly the older members—honor and respect them for the good they have done. Their instruction was entirely laboratory instruction, such as has been referred to, but of the good class.

Now, I think we can be critical here to-night without giving offence. I have had opportunities for testing the work of the colleges, and I have been convinced for a good many years that the great failing of our schools has been in this very question of technique. Men have come before the board for examination who were high up in theory, but their practical work was not such as should have been expected from a graduate of three years' study, and the serious question in this connection is, Why did they receive a diploma? There was lack of faithfulness somewhere in regard to the tests that had been applied. If you look at our technical schools,—the Institute of Technology has been referred to,—you will find that the student who does not make good progress during his first year is not allowed to continue in the course. I think that is true of all our reputable technical schools, and in some cases the student does not even get as far as the first year's examinations,—perhaps he only gets through six months, when he is dropped. One of the recent classes of the Institute of Technology, graduating about eighty, had a membership of four hundred at the start, and I think nearly one-half were dropped at the end of the first year. There is a "weeding out." Do the dental colleges do that? Have they done that in the past? Is the man who shows himself to be a bungler, not possessed of the inherent idea of mechanics, forbidden to come back at the end of the first year when the fact is discovered? Now, a thorough form of laboratory instruction would make that test, and the dental colleges must make that test. They must stand as guards at the gates of the profession through which no man, however well he may understand the theoretical ideas, will be allowed to pass if he shows want of aptness in mechanical dexterity; he should be stopped from progress and relegated to some profession or calling where his success will depend upon intellectual ability. I think this scheme of manual training will develop that, and if the colleges would adopt it, we should have a very much greater percentage of success in the work of our operators. In matters of scientific investigation and education our profession has made extraordinary progress during the past twenty-five years, and the dental colleges should

have the chief credit, but I think I may safely say that there has not been a corresponding progress in manual dexterity. Dental machinery, the engine, and all other dental appliances, have, to a certain extent, superseded the necessity of manual dexterity, so that the difficulties which had to be met by the earlier dentists, before there was ever a rubber dam applied, can hardly be appreciated by the younger men who have been taught that the proper way to do certain operations is to use a certain appliance, and without that appliance they would not know how to begin to do it. I am firmly convinced that to be useful members of society a dentist must be a good worker. The dividing line between good to the patient and evil to the patient is sometimes exceedingly thin, and the dentist's ability to keep on the right side of that line consists, not so much in his knowledge, his science, as in his being able to accomplish desired results and overcome difficulties with the skilled hand. The successful result is due in a greater degree to skilled hand-work than to correct reasoning,—head-work. The good directing mind is a failure in a dentist unless there is also a skilled hand, but the skilled hand is a measurable success if the mind is not so well trained. Now, we must meet this question intelligently, and it seems to me the best way to do it is the adoption of the laboratory system for the training of the hand, the elimination bravely from the schools, no matter how large or how small their numbers, of those who have not the aptitude to make successful all-round dentists.

*Dr. Fillebrown.*—I want to be sure that I was understood in regard to my position on the matter of dental education. As I understand the idea of the paper to-night, it is mainly to call attention to the fact that the laboratory methods are not developed to any such degree as the scientific methods in the present system of dental education. I fully agree with that position. As has been said, in the early days of dental improvement the mechanical features received the larger share of attention, and the result was that many times the clever operator was lacking in his knowledge of anatomy, pathology, and like important studies. And the dental schools sought to remedy these deficiencies by enlarging upon the scientific methods, and they have gone on elaborating in this line until at the present time every school in the country is provided with able teachers in these branches, while, on the other hand, it is lamentable to see the number of students who are graduated with but a very little knowledge of practical manipulations.

In our dental school, while we have been in sympathy with this

scientific movement throughout the land, and are continually adding to the scientific instruction, we are also enlarging and perfecting our laboratory methods. We are not neglecting either department, and we certainly do want to see the laboratory method more perfect in every detail. We want to see the student thoroughly familiar with the use of instruments, and exhibiting a fair degree of skill in their manipulation. Some time ago I examined an apparatus for the development and exercise of certain parts, called the "technicon." It is so arranged as to provide a separate movement for hand, finger, wrist, and arm practice. It can be graduated to measure the resistance used all the way from one to fifty pounds. It is an admirable machine, but, as it costs from fifteen to twenty-five dollars, it is rather expensive for use in a large class. Professor Fitz believes that he can devise and make some instrument that will cost but a few dollars, and will give the motions which are needed, and also furnish a dynamometer to show the result of the tests. I hope ere long the Harvard School will offer such practice to students, and insist that before they shall enter upon the practice of dentistry they shall have attained a certain degree of manipulative skill, and shall exhibit an average amount of strength in the various muscles which they will be called upon to use in their daily work. In this way I believe we shall lay a foundation upon which they can build a manipulative dentistry that will astonish some of our present reputable operators.

*Dr. Williams.*—As I understand the paper by Dr. Kirk, he urges that not only should the manual skill be trained, but that its application should be trained,—that is, it should be used with knowledge of principles and discrimination in their relations; for the greater the skill misapplied, the greater the blunder. I am very glad to have this idea that I have entertained for so many years so well presented and so ably advocated. I read a short paper at the Pan-American Medical Congress, that was held in Washington last September, in relation particularly to the knowledge of medical and surgical principles and training in their application to our practice, and illustrated by some cases the serious mistakes that might be made under the highest skill misapplied.

The point must not be lost sight of that the fundamental principles are just as important as the skill. We cannot reason that because a man is a good cabinet-maker, or a good jeweller, or a good engraver, therefore he is a good surgeon, or a good dentist; for if he knows nothing about the principles of the vital economy on which he is working he may fail, no matter how skilful he is.

What we need, then, is a more constant training in the exercise of manual skill with reference to the principles on which one is to apply this skill, or refrain from applying it. If we keep in mind both of these things, I think we will continue to advance; but if we confine ourselves to either one alone,—either all skill or all principles,—we are not progressing.

*President Smith.*—Do you care to close the subject, Dr. Kirk?

*Dr. Kirk.*—Yes, I would like to say a few words. In the first place, I wish to thank the members for the very interesting and very full discussion they have given to the subject of the paper. I fear, however, that a misapprehension exists in relation to some of the ideas set forth in the paper,—that is, that I have unduly emphasized what might be called the manual-training phase of the subject, and minimized the importance of the scientific side of dental education. If that inference has been formed, I wish to correct it. I fear that we use the terms "science" and "scientific" sometimes without thinking exactly what we mean by them; we pronounce them "trippingly on the tongue," disregarding or unmindful of their true meaning. Now, as I understand the term science, it means any classified system of knowledge held together by certain definite principles. As to the term scientific, I doubt if we can give an exact definition of it until the psychologist has thrown more light upon the problem of just what is involved in the mental processes which constitute the scientific method of thought. We are probably safe, however, in regarding it as a definite mode of reasoning with respect to classified knowledge. If, then, science is a system of knowledge, and thinking is to be done scientifically, it implies that we must have as a groundwork a knowledge of objects or phenomena about which we are to reason, and the purpose of my paper was to advocate the importance of obtaining our foundation knowledge of facts and phenomena at first hand from the objects themselves. It was not my intention to give undue prominence to the manual-training feature in dental education; the manual training is an incidental feature, and a means to an end. Manual training for the purpose of cultivating manipulative dexterity is a necessary factor in the development of an all-round dentist, but that must come as an incidental feature of the training, and is in a considerable degree proportioned to the natural aptitude of the student for his special kind of work. It is not a question of minimizing the importance of instruction on the scientific side, which Dr. Brackett has referred to as including physiology, chemistry, anatomy, pathology, etc., but rather an application of the labora-

tory system as a method for obtaining a knowledge of the facts on which those sciences are founded. We study anatomy by the laboratory method in the dissecting-room. No amount of lecturing could convey to our minds a comprehensive and permanent knowledge of anatomy; we must acquire our knowledge from the cadaver. One of the best manual-training teachers in this country has said, "Know first the thing, and then reason about it." That is the order of relationship, the method of study which I have endeavored to bring before you, and which I hope we shall be able to promote. It is not that I would emphasize the laboratory method solely as a means of acquiring manual dexterity and skill, but rather as a means for enabling the student to acquire at first hand and for himself a knowledge of facts from which he can reason scientifically, and therefore correctly, thereafter. If the student does not have that kind of foundation upon which to build, his only alternative is to take his knowledge second-hand.

I might lecture for hours upon the physical properties and characteristics of an object before a class of students, but if they had never seen the thing about which I was talking I could give them only a vague and evanescent idea of it. No amount of explanation will convey to a person who has never seen an orange, for example, an exact and permanent idea of what it is; but if I pass him an orange and let him examine it, he will, in a very short time, if he observe carefully, have a grip on the peculiarities and qualities of an orange such as nothing else could give him, and he will not be likely to forget it. It is on this account, therefore, that the student should be made acquainted with the objects with which he has to deal and the phenomena which they present, their essential characteristics and relationships, and then be taught to reason correctly about them. That is the basis of the scientific method. The difficulty with the theoretical phase of instruction, which has been referred to to-night, and which has so largely been presented to the dental student heretofore, is that too often he has been taught very little of true science, and, in its stead, has been given a pseudo-science by a method of instruction founded largely upon hypotheses. What we need is a truly scientific method of instruction based upon a practical knowledge of objects and phenomena presented to the mind of the student through the medium of his own perceptive faculties.

*Dr. Williams.*—I am reminded of what the elder Agassiz used to say to us: "These, gentlemen, are mere facts; facts are stupid things, except so far as they go to elucidate a rule or prove a principle."

The facts that Dr. Kirk alludes to are necessary to the practical study of the principles which are so important, which, I suppose, he fully agrees to.

*President Smith.*—We have with us this evening a very distinguished gentleman, who has been recently elected an honorary member of this society,—Professor F. W. Putnam, Peabody professor of Archæology and Ethnology at Harvard University, and we should be very much pleased to have a few words from him.

*Professor F. W. Putnam.*—Gentlemen, I am glad to be with you. Our subjects have many points in common,—I have had a great deal to do with the teeth of the people of the past; you have a great deal to do with the teeth of the people of to-day. I have studied with much interest the differences and peculiarities in the teeth of different races, and have noted, among other things, that in some races the molars are very much smaller than in others; that in some races the third molar is not extruded from the jaw until a very much later time than in others; that in some peoples the wisdom-tooth is not always developed; and that from the anthropologist's stand-point it looks as if this wisdom-tooth was a useless and rudimentary tooth, which is gradually disappearing. . . . It is interesting in this connection to note the fact that among the Hindoos, the descendants of one of the oldest stocks of our own great branch, the wisdom-tooth does not occur in probably more than one-half of the adult population. When you meet with me in Cambridge I can show you a number of specimens among our three thousand crania which will be of interest to you, and will give us an opportunity of discussing prehistoric conditions from the skulls themselves.

I have been very much interested in the talk and paper of this evening from the stand-point of a teacher in other departments, and I agree fully with what has been said of the necessity of thorough laboratory instruction; and I heartily approve of what Dr. Shepard has said in relation to carefully observing your student during the first year; and should the student prove mentally and physically unqualified for his chosen life-work, I consider it the duty of the instructor to advise his dropping it and taking up some other branch. . . . For instance, it seems to me that some of the qualifications necessary in a student of dentistry are quickness of perception and firmness, quickness, and delicacy of touch. In the Anthropological Building of the World's Columbian Exposition we had several rooms devoted to the study of the human race, and one of the rooms was the Laboratory of Psychology, where were all the

instruments for testing the sight, hearing, touch, smell, taste, memory, perception, etc., and thus judging to a certain extent by a comparison with the average of the natural mental abilities of the subject. . . . Would it not be well to subject a student of dentistry to these tests before allowing him to take up the profession? Certainly a very dull man would not make a good dentist,—that is, if I am to judge by the shining lights that I have met in that profession. He should be intelligent enough to recognize pathological conditions; he should be gentle but quick in his movements; he should possess great power in his hands, but should be delicate and accurate in his touch. . . .

In regard to laboratory instruction, it is practically what is followed in my department. Heretofore I have had students who had only graduated from other courses, but for the next year a course is offered to undergraduates. The graduate course is three years. The first thing I do with a student is to place before him a lot of stones,—some of them whole, some crushed with an iron hammer, some broken by striking one stone against another, and others carefully chipped. The student is obliged to study these specimens until he is able to describe the differences which he notices, and to tell how the peculiar formations and structures were brought about. Then I have him practise breaking the stones in various ways, and try to form similar objects to those he has been studying. In this way, while developing his reasoning and descriptive powers, he is gradually training his powers of manipulation. In the same way the student is required to study fabrics; to find out with the aid of his lens the minute characters of each specimen, to tell what it is composed of, and to describe the manner in which it is put together. For instance, one is made of reed, another is made of fibre, and another of twisted fibre. After working this out in a satisfactory manner, he is given a lot of threads and required to imitate the methods of manufacture of the fabrics before him. . . . By this method he receives a thorough laboratory training as a basis for his future studies. He has, as Dr. Kirk so well described it, obtained his knowledge "first hand from the objects themselves," and putting that and his theoretical knowledge together, he will be able to understand the science as a whole. I will say still further that in my department I advise students not to refer to books in order to find out what some one else has said upon the subject until they have made a thorough study of the facts. In the graduate department the student is expected to devote himself to a general study of objects for his first two years. In the third year he takes



up some special research, and is then expected to add to his observations a knowledge of all that has been written on the subject. If you give a student a book to start with, he is always depending upon authority. He never draws his own conclusions, and his knowledge of a subject is limited to what Mr. A, Mr. B, or Mr. C has written about it.

WILLIAM H. POTTER, D.M.D.,  
*Editor American Academy Dental Science.*

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## ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

At a regular meeting of this Society, held October 13, 1894, President Peirce in the chair, Dr. Wm. L. Fish, of Newark, N. J., read his paper on "Cervical Cavities and their Treatment."

(For Dr. Fish's paper, see page 758.)

### DISCUSSION.

*Dr. Truman.*—The clamp seems to be an effective one; but it is highly complicated. There are few clamps so well made that they are not liable to cause disturbance. I think those who are here will bear me out in the assertion that if a clamp be forced upon the gum margin, as that appears to be, irritation will necessarily follow; pathogenic germs will gather around the tooth that may eventually result in pyorrhœa alveolaris, or at least in inflammation of the pericementum.

This is not mere theory, for I have observed such complications for years, ever since the introduction of clamps.

The gentleman has asserted that retaining-points are a snare. Now, I am happy to say that I do not agree with him. Retaining-points were introduced, in the earlier days of the profession, in a form, perhaps, that was not satisfactory. I remember, twenty-five years ago, I called attention to retaining-points properly made as I considered they should be. I practised and taught for many years that mode of filling teeth and anchoring them. And I hold to-day that it cannot be relinquished except in special cases. What do you get by undercutting? If there is any break or any pressure you destroy the anchorages at once, and the filling is lost. If you want to hold a filling in a tooth you must anchor it somewhere, and I deny, positively, that retaining-points cause thermal action

upon the nerve if they be properly placed, any more than deep undercutting or the filling itself, if it approximates nearly to the pulp.

*Dr. Broomall.*—I entirely agree with the essayist on the subject of retaining-points. It has always been my opinion that they are valuable simply as a good beginning on which to place a filling, and do not deem them useful for holding a finished plug in place. As the operator approaches the surface of the cavity, there is a tendency for such anchorage to break away. I myself always use undercuts, and I think them far preferable to retaining-points.

Dr. Truman then asked those opposed to retaining-points what they would do with a tooth that had no cavity in it that might be necessary to build out. "Formerly before we became so æsthetic that we would not have gold in front of the mouth, it became necessary to occasionally build down an incisor. Even now that happens, and what can you do with it unless you make retaining-pits? When teeth are perfectly smooth, I build these down by making a circle of pits all around the tooth-margin. Then placing a screw here and there, I insert the gold, and such fillings have remained secure and firm for years. I would like to ask the gentlemen who are opposed to this mode of filling how they would treat such a place or cavity."

*Dr. Broomall.*—Dr. Truman says he occasional puts in a screw, and I think he answers himself; whereas, if you have the retaining-points you run a risk of not getting firm union.

*Dr. Head.*—Does the gentleman mean to say that a screw fastened into the tooth-structure will have a more intimate connection with the tooth-structure than gold hammered in there.

*Dr. Broomall.*—No, I do not mean that. I contend that gold in the shape of wire screws is stronger than any you can put with a plugger into a small cavity that has just a retaining-point.

*Dr. Boice.*—I can heartily agree with Dr. Truman as to the influence of clamps on the teeth. I see it every day, and I have been thinking, for the last five years, that it would be better if we had never seen a clamp. I am using them less and less every day. The clamp presented here to-night is a very ingenious thing, and contains many valuable points we can utilize.

In reference to retaining-points, there is a light-house on the British coast that was fastened year after year with bolts into the rock, and every time the storms came, it would be washed away. The bolts represent the same thing you have in filling teeth. It was my pleasure when I began to study dentistry, to come in con-

tact with a man by the name of Head, and he said retaining-points were bad, therefore he wanted grooves. Now the light-house went away year after year, until a certain engineer cut grooves in the rock and put in the blocks, and then a key or centre block in that, and it has been standing for a hundred years. If you use that same principle in filling a cavity you have an easier filling and a better anchorage.

*Dr. Faught.*—I have listened with great pleasure to the paper. I am one of those who take the author's position in regard to retaining-points. I have observed numberless times, in cavities where fillings have been dislodged, that you will often find a little bit of gold in the retaining pit. This fact shows that when the filling is completed the retaining-point is of no further use, no matter how firmly it be condensed. I therefore shape the bottom of the cavity so that it will hold the gold without any necessity for such aid.

In regard to the clamp, I cannot believe it is such a complicated structure. It seems to be made according to true mechanical principles. Dental practitioners will use clamps, and if one uses a clamp at all, I believe this one will do the work better than any of those furnished to us by the depots.

*Dr. Fish.*—I take issue with Dr. Truman in reference to retaining-points. If a tooth is strong enough to allow an undercut, no matter how slight, if the walls of the cavity are made absolutely parallel, and that cavity is filled with perfect edges, the fillings will not come out.

The subject was then passed, after extending a vote of thanks to the essayist.

The President then called upon Dr. Brubaker to read his paper on "The Causation of Dental Erosion."

(For Dr. Brubaker's paper, see page 739.)

At the close of the paper, Dr. Brubaker exhibited a small chloride-of-silver battery, similar to those employed for generating electricity, and in removing superfluous hairs, and explained the manner of using it. By introducing the point of the needle into a hair-follicle, the current being applied, the bulb was destroyed. This, the doctor did as illustrating the manner in which the diseased glands might be eradicated.

While reading his paper, the essayist passed around for inspection some teeth with which he had experimented.

Dr. Peirce stated that he had examined the teeth before they were treated, and they were perfect, entirely free from any abrasion or cut.

Dr. Peirce asked Dr. Truman to open the discussion, and asked if the speaker's remarks were consistent with his experience.

*Dr. Truman.*—It confirms my own view of the matter. I never could credit the uric-acid theory, and I am confident that what Dr. Brubaker has said in his paper is absolutely correct.

I am also pleased to note that we have some ideas in regard to what may possibly be one of the causes of erosion. I think the examination of the teeth indicates, as he has stated, that a plan of investigation might be satisfactorily carried out that would lead to some results. I don't see, however, that his plan of destroying the glands will help matters very much. If the glands in the lip are destroyed, what will be the effect on the secretion necessary for the mucous membrane of the lip? I would like to ask Dr. Brubaker to answer that question. The lip would become very dry and difficult to manage. It is difficult now, for some of us to talk in our lectures; but aside from that, I question very much whether the glands are really the cause of erosion, although his research is an indication of what may occur.

Dr. Brubaker has very kindly alluded to some work I performed in this direction many years ago, while endeavoring to discover the cause of erosion. I carried the experiments into the night season, satisfied that the day hours gave a neutral reaction, and that it was impossible to secure satisfactory results during the period of the greatest flow of saliva. And I think I proved conclusively, certainly to my own mind, and to the minds of some others, that fermentation progressed through the night, and that it was not possible in the daytime. Dr. Kirk's idea was different, and he experimented on the glands of the lip in the daytime, and demonstrated by the aid of litmus-paper that there was an acid passing from the glands at all times during the twenty-four hours.

Therefore, we may conclude that at night the acid would not be more effectual in destroying the tooth-structure than by day. But I am inclined to think from my own observations that at night we have increased fermentation independent of any glands, and that this also tends to the destruction of the teeth. I am very certain, from clinical observation, that these are facts, for I have stopped erosion altogether by the use of an antacid.

Of course, the question is as yet much in the dark; I acknowledge that, and I suppose every one else does. The erosion by the old style of wire clasps, used many years ago, produced precisely the same effect as the fermentation ordinarily occurring at night, fermentation taking place between the clasp and the tooth.

Dr. Brubaker answered the preceding speakers in the following manner:

"I am well aware if you destroy the labial glands and diminish all secretion the lips will become very immobile; but, as a matter of fact, there are probably never more than a half-dozen of the glands which are diseased. The specimen shows there are fifty or sixty present, and the destruction of even a half-dozen would not interfere very materially with the quantity of secretion."

*Dr. Truman.*—How would you know when a gland is diseased? What are the indications?

*Dr. Brubaker.*—The indication of which gland is diseased is shown by pressing upon the gland. As Dr. Kirk demonstrated, pressure upon the glands forces out of it a fluid which is thin, watery, and very different from the normal secretion. And also the orifices of the glands, I am told, are nearly always enlarged, showing redness and congestion.

*Dr. Faught.*—I listened with great interest to the paper, and still I cannot entirely believe that the uric acid explanation is done away with. I base that upon the assertion within the paper. The paper lays particular emphasis upon the fact that this derangement in the gland may be due to some internal irritation within the gland itself. So it would seem to me that we are now touching only upon the process which takes place at one end of the line, and that it may still be possible to look for uric acid as an irritant producing this pathological condition.

*Dr. Gaskill.*—I think I agree quite fully with Dr. Brubaker so far as my limited knowledge of the subject will allow. He shows that the marked action in most cases of erosion must come from the glands of the lip, although the use of acids for systemic purposes may also have a marked effect on the teeth.

I have had several cases, and reported one which was very marked, of the use of the "microbe-killer." It was a lady who came to me several years ago, and when she first presented herself I noticed that some gold fillings in the front teeth looked as though they had never been properly dressed down. I asked her if she was taking acid medicines, and she said she was using considerable of the microbe-killer. She brought me some, and I found it was markedly acid in action. When I saw a similar indication in the teeth of other patients I questioned them, and I found three others using it. The result was the same with all. There was the greatest wasting away, both on the cutting-edge and the palatine walls, while the labial walls were less affected, owing to the protection given by the lip.

The subject was then passed and Incidents of Practice were taken up.

Dr. Fish then exhibited a black diamond, set in a bar of steel, that he claimed was most efficient in truing up old corundum wheels, a small tap, most valuable and inexpensive, and some asbestos rope that could be used as a rapidly adjusted investment for crowns or small pieces of bridge-work where soldering was required. Adjourned.

JOSEPH HEAD, M.D., D.D.S.,  
*Editor Odontological Society of Pennsylvania.*

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### HARVARD ODONTOLOGICAL SOCIETY.

THE regular monthly meeting of the Harvard Odontological Society was held at Young's Hotel, Boston, on Thursday evening, April 26, 1894, at six o'clock, President Eddy in the chair.

A paper, entitled "Some Details as to the Care of Dental Instruments," was read by Dr. William H. Potter.

(For Dr. Potter's paper, see page 754.)

#### DISCUSSION.

*President Eddy.*—It is with great pleasure that we have listened to this valuable paper from Dr. Potter; it is one of the most important subjects that we have had brought before us,—the cleanliness of our instruments.

*Dr. Hitchcock.*—I can emphasize what Dr. Potter has said most surely. The strength of modern surgery is the use of antiseptics; the only difficulty lies in what antiseptic to use and the method of using it. Formerly, consumption was understood to be non-contagious unless the patient was more or less predisposed. This theory is almost entirely exploded, and it is now conceded that the children of consumptive parents need not necessarily have consumption; the difficulty lies in the sputum. In Philadelphia a society has been formed whose object is to prevent expectorations in public places. They hold that a lady passing along the street takes up sputa upon her skirts, that it dries, and is blown through the air and inhaled. In Paris a family moved into a house which had previously been occupied by a consumptive. Two of the family who were perfectly healthy before contracted the disease. An examination proved that bacilli of tuberculosis

were upon the walls; the moving of furniture, dusting, etc., put the germs into circulation, and they were taken into the lungs. Nature has a very kind way, if we are in a perfectly healthy condition, of protecting us from the action of these germs by throwing a deposit around them. Very frequently they are taken into the lungs and held there until a favorable opportunity is presented for them to commence their work. The amount of bacilli ejected in the sputa of consumptive patients varies from two hundred and fifty thousand to four millions in twenty-four hours.

In Europe about one million die every year of consumption, or one-eighth of all deaths. Probably nine-tenths of the cases of tuberculosis are caused by inhalation. Another method of infection is through wounds. Tuberculosis of the lungs will often be carried to the intestines and bowels by swallowing the sputa. Two cases of diphtheria were discovered in a Brockton school which were traced to the use of a lead-pencil. Syphilitic and diphtheritic cases may not exhibit marked symptoms. We may have a case of diphtheria where the person is not specially well, the throat not sore enough to be noticed, still, he can inoculate fatally another person. A case is related where a teacher going away for the summer kissed her pupils good-by at the train. Over half of them came down with diphtheria. A physician, a patient of mine, while attending a child with diphtheria, was bitten on the finger. He paid no attention to it at the time. Soon, however, the glands of the axilla became very much swollen, the disease nearly proving fatal. Necrosis of the jaw followed, with loss of three or four teeth and quite a little of the bone.

Syphilis is commonly brought about by direct contact. France has passed a law requiring every workman to have his own blow-pipe. Toy balloons with a whistle should not be used by our children; the vendor generally tries them first.

As to the frequency of these syphilitic mucous patches which were shown to us by Dr. Whitney two or three months ago, Vasseroles in his investigations found that out of one hundred and thirty cases in men these mucous patches appeared on the tonsils in one hundred, on the lips in fifty-five, and on the tongue in eighteen. In women he found only about one-half this number had patches on the tonsils, attributing the cause in men to the use of pipes, chewing tobacco, etc., thus irritating the mouth.

I have lately had two or three cases of canker in the mouth that looked so nearly like those that Dr. Whitney showed us that special care was given to the instruments, the mirrors being

labelled and set aside. Cases of tonsillitis, consumption, etc., have been treated in the same way.

The surgeons of to-day take no chances,—if they happen to drop a needle, for instance, on the floor, it is not used, because they make it a point to handle nothing but what has been thoroughly sterilized. It is because of this carefulness that surgery has become what it is,—an exact science. The cases of recovery after the operation of ovariectomy until this sterilizing precaution was adopted were very rare.

An article recently stated that a church in the western part of New York had employed an expert to examine the communion cup, and he found twenty-two varieties of bacteria, and they now use the individual cups. A church in West Roxbury has followed their example. The general idea is erroneous that syphilis is found principally among the lower classes.

I think the dentists themselves are in more danger of inoculation than their patients.

*Dr. Upham.*—We have had altogether in our meetings a good deal to say about the mouth-mirror and its sterilization; I would like to ask Dr. Potter how he takes care of it?

*Dr. Potter.*—I distinctly said in my paper that a mouth-mirror was not subject to sterilization, and if one has a syphilitic or a tubercular patient, the only precaution which he can take is to have a separate mouth-mirror. It is the most difficult thing we have to treat; it cannot be satisfactorily sterilized,—it can be washed mechanically, but that is about all.

I should judge from some of the remarks made to-night that the method of sterilization which I have spoken of was deemed a very laborious and troublesome thing, something that would interfere with one's practice and take up a great deal of time, but it is not so with me. If you have duplicate instruments, you need not dread the expenditure of time at all. It is something that I give no thought to, because it goes on so naturally and readily. I treat every case as if it were possibly contagious, because there are many cases that are contagious and yet are difficult to detect; so I put them all in one category, and whenever an instrument is used it is sterilized, and then put back into the case.

*Dr. Cooke.*—I would like to ask Dr. Potter what he does with the wooden-handled instruments?

*Dr. Potter.*—I do not use them.

*Dr. Cooke.*—Another thing very difficult to sterilize is the sleeve of the hand-piece of the engine. I have two or three of the



hand-pieces, and treat them by washing thoroughly in hot water and putting in bichloride. I might also say that every instrument I use goes into a tray before I receive the next patient, and is washed thoroughly with soap and water, and then put into a weak solution of bichloride.

*Dr. Potter.*—I do not wish to leave the impression that my instruments are not washed. I believe that washing is the foundation of all antiseptic surgery. My instruments are first washed, and are then sterilized as an additional precaution.

*Dr. Taylor.*—I have a habit of using a scaler with a large wooden handle, because I like the handle, and I put that into the sterilizer. I also treat the hand-piece of the engine in the same way. Mine has a cone socket, which I unscrew, then sterilize the point and wash the handle the best I can.

It is impossible to sterilize the mouth perfectly, and if we put the rubber dam upon the teeth, the soft tissues are protected. The hard tissues are not very susceptible to the action of the germs, and the chances of contagion from them are very small.

*President Eddy.*—I would like to ask Dr. Potter if he washes his rubber dam thoroughly before applying it?

*Dr. Potter.*—No, I do not. Rubber dam is handled mainly by machinery, and cannot come very much in contact with unclean things.

My idea is to have a system as perfect as possible. I do not claim that it is possible to eliminate every and all forms of germs, but we must do the best we can and take few chances.

HENRY L. UPHAM, D.M.D.,  
*Editor Harvard Odontological Society.*

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## Editorial.

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### THOUGHTS, PAST AND PRESENT.

THE closing month of the year naturally tends to reflection, and the usually careless mind, as the days draw to the end, steps aside from the turmoil of daily life to consider the relations of the past with the present, the future being largely left for pleasant dreams.

With this idea impressing us, we give to our readers some of

the thoughts that have forced themselves into prominence during the past year in connection with dental journalism and professional duty. Our own journal has claimed so much of our care that a short *résumé* of its history may serve to revive pleasant memories and perhaps bind more closely the interest of those who have followed its fortunes through the earlier years of its active life.

The JOURNAL, under the name of *The Independent Practitioner*, was established by the original syndicate in New York, with the idea, as understood, that the dental profession might have a medium for an independent expression of thought upon all subjects connected with its welfare. While this was an important feature, it was also hoped to eliminate influences of a non-professional character from it, and aid in educating dentists to a higher standard of thought and action. That this was accomplished to a large degree by the controlling management is now a matter of history.

That this influence should have a wider field and a more enlarged opportunity was felt by many, and to effect this a company was formed to purchase *The Independent Practitioner* and give it the best conditions possible, to still further elaborate the good qualities of the journal named. This was finally accomplished, and the stock was rapidly absorbed, principally in the Eastern States.

The name of the journal was changed to that now held, and it has occupied a prominent position among the dental periodicals for the past six and a half years, and for four and a half years under the present editorial management.

During this period the JOURNAL has steadily made its way as an exponent of a higher intellectual culture and a broader professional standard. The company very liberally gave the editor freedom to act as his judgment might dictate within certain limits, and these were in entire accord with his own conception of duty.

The work entailed great labor upon a few earnest men. They, through all the years it has existed, have devoted time and money to effect its permanent establishment, with no other reward in prospect but that dentists might have at least one journal not complicated with outside influence foreign to its best welfare. As the years passed on this labor was increased and the responsibilities heavy, but these have been cheerfully borne in the interest of the profession.

The apathy so generally manifested is a reproach to the dentistry of the United States. No profession can have a healthy life under its malign influence, and, unless a change is brought about, dentistry in America must abandon its egotistic assumptions or

eventually be rated below the professional standing of that existing among all civilized peoples. A profession cannot exist without an advanced professional spirit, and without this it has no claims to recognition.

What do we mean by professional spirit? That feeling which regards the advance of the calling superior to all selfish considerations. With this definition how do we stand? We have, first, a large proportion who never subscribe for a journal. They may be rated as unworthy of any consideration whatever, and yet they are the dead weight, the nightmare, of our professional life. Secondly, the men who take a cheap journal made up of excerpts from original thinkers, and care for these periodicals only as they contain novelties on their advertising pages. Thirdly, a class who read, but will do nothing to aid by contributions or personal influence. Fourthly, a class who will at any time barter the products of their societies for money, and are ever ready to "crook the pregnant hinges of the knee" to capital. Their idea of professional excellence does not rise above the sordid principle of trade. Fifthly, men who are imbued with all the attributes of good professional men, but are negative in character, and ever willing to have the work of the profession transferred from their own to other shoulders. This, in brief, is the analysis of character met with among the antagonizing elements that bar the way and have been a dead weight upon professional progress.

With the fourth class we desire to have a word. There are several examples where it has bartered its work for a consideration. We hold that when the American Dental Association parted with the publication of its proceedings, it sacrificed its place of honor and dampened its professional spirit, and it rests under the incubus of having sold its birthright. The example has been baneful to itself and to others. We maintain that every scientific society, to be true to itself and regardful of its honor, must make the sacrifice to print its own proceedings and that by its own efforts. If it cannot do this, there is little reason for its existence. If it transfers its own work to others by the method indicated, it seals its own doom.

The example it set has been followed by many associations, and we have been treated to the shameful bartering of products all over the country, and giving these to the highest bidder with as much alacrity and disregard of ethical principles as the auctioneer sells his goods. That this is a disgraceful condition of affairs there can be no question, and the so called profession that permits it in the code is surely bound to retrograde. A profession, to be such, must

be above reproach. Better far that societies should perish than that this should continue.

The bright part of this otherwise dark picture is that some societies, and we could name them, have held the standard of professional life so high that no temptations, however golden, could reach them. These are the saving elements of the profession, and will, we are sure, lead it out of the dismal swamp of an isolated and selfish existence.

Few, we think, appreciate the full value of a journal such as this. It cannot come in competition with any other journal, for its aims are not in any sense of a selfish character. It has in the past endeavored to be an educating medium, to lead and not to follow, to impress on its pages a high standard of excellence in matter and in the quality of its work. The trivialities of journalism, as it is understood elsewhere, can have no place on its pages. It has endeavored to teach by example and precept that a profession to be worth the naming must be dignified. That "cap and bells" may do for the amusement of the unthinking crowd, but not for those who accept higher things. Its aim has been to lead the colleges of this country to as high a standard in professional education as may be consistent with existing circumstances. It holds the individual as the type of the mass, and as the separate parts are improved will the body become perfect. Hence we demand that each man who enters dentistry shall be taught, not only to honor it, but be forced to obey its highest precepts. In a word, the JOURNAL stands for the best that is obtainable in education, in ethics, and in general culture.

This journal was established and will be continued upon the basis as originally planned. There will be no compromise with the evils named. It hopes to be able to meet the best thought of the profession and to advance with it. It will demand the highest standard attainable in college, professional, and individual work. With these aspirations we close the year and welcome the next, confident that, whether we are sustained as fully as we should be or not, sooner or later dentistry will awake to the deep responsibility of its position.

The present is a fruitful period for good resolutions, the past we cannot change, but if it has had its proper value it has moulded thought and laid the foundations for a more satisfactory future.

The period demands a close introspection in regard to our ethical and secular duties, and these cannot be too closely scanned. It is the lack of this that gives the dental profession its shifting and heedless elements.

The duty of the hour seems to us to be to sustain unswervingly the highest manifestations in the profession, loyalty to it is the first consideration, and then will follow that other and correlated virtue, a readiness to make sacrifices for its advancement.

Progress is always slow. The years come and the years go, and the active worker therein fails to see much change, but the tide is ever sweeping onward and the grains of sand are ever becoming more rounded, ready to polish the angular surfaces of succeeding particles. This is the mission of humanity, as we understand it, and to meet this and prove an effective agent journals are necessary.

The journal of the present must be in advance of that of the past. It must be true to the enlarged standard of human thought and sustain the faltering and educate the ignorant. This has been the mission of the *INTERNATIONAL DENTAL JOURNAL*, and it should receive the undivided support of all who make dentistry an ever-growing profession.

With this aim and these hopes we permit the year 1894 to pass into history without regret, and welcome the new birth with renewed aspirations for a higher development and enlarged opportunity.

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## Bibliography.

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**THE ANATOMY AND PATHOLOGY OF THE TEETH.** By C. F. W. Bödecker, D.D.S., M.D.S. With three hundred and twenty-five Illustrations. The S. S. White Dental Manufacturing Company, Philadelphia, 1894.

The readers of dental literature have heard from time to time that Dr. Bödecker had in preparation a work on dental pathology, and its appearance has been awaited, by some at least, with eager interest.

The author's well-earned reputation and long service in this direction led to the hope that at last we were to have a pathological work not only of scientific value but of practical importance.

The author has shown in his "decade of work" a patient and persistent effort to make a volume worthy the perusal and study of the intelligent dental practitioner; and in this he has certainly succeeded, for it is imagined very few of that class but will give

its ideas close attention, though it is not to be expected that many workers in dental tissues will accept his conclusions.

The book opens with a description of the superior maxillary bones, followed by the inferior, characteristics of the teeth, articulation, and general anatomy. These cover forty-six pages.

With Chapter VIII. commences General Histology, and from this on through three hundred and one pages the author gives in detail his own views in regard to the development of dental tissues, together with those of Heitzmann, Abbott, Hart, etc. Much of this has been made familiar to dental students in articles prepared for dental periodicals. The long contest waged over the theories of Heitzmann, Bödecker, and Abbott may possibly be fought once again now that they are presented in a concrete form. In fact, the work seems to be in the nature of a challenge to the world at large in this direction. Space does not permit, even were it justifiable, a criticism of these theories. While there is much in them in accord with the writer's views, there is also much that he cannot accept. The charge frequently made, that the new views of the histology of tooth structure are based solely on drawings in which the personal equation is a prominent factor, will doubtless be repeated now that we have them in consecutive order, for the drawings are all by Heitzmann. This, as the writer views it, is a grave error. Drawing, however beautifully done, and Heitzmann is a master in this direction, cannot carry conviction. A few photomicrographs would have accomplished far more. After all that has been said antagonistically to the claims of a reticulum in tooth structure, it seems strange that the author should have allowed this book to go to press with no real evidence to prove the correctness of the theories advanced. It leads to the suspicion, whether justly founded or not, that either the slides cannot be represented or that they have no real existence. Those who know the author are not prepared to believe this; hence it would seem that no expense should have been spared to meet this demand.

Chapter XXI. begins what may be called the second part of the book, and opens with "Inflammation." With the exception of a few paragraphs this entire chapter is taken from a paper by William Atkinson, M.D., of New York, on the "Origin of Pus." Why the author should have given the views therein contained as being "based on the investigations" of Dr. Atkinson remains a mystery, as the reader will fail to find a record of personal investigation, but a good deal of history, and a large proportion decidedly out of harmony with modern ideas.

It is strange that the blunder of Atkinson should have been repeated here, wherein he stated in the original paper "that the emigration of the leucocytes had been seen in England by Walker and Wallace. If any such men existed in connection with this subject, begun by Döllenger in 1819, the writer is not aware of it. Williams, Addison, and Waller, from 1842 to 1846, were the distinctive English names connected with this work, and Waller so clearly proved the diapedesis of the leucocyte that, notwithstanding all the difficulties he had to contend against, his work stood; so that when Conheim made his brilliant discovery in 1867, Waller's name was eventually joined with the latter as having equal merit in the work. The fact that the author accepts Atkinson's work makes him responsible for errors.

The Waller-Conheim theory of emigration of the leucocytes of the blood finds scant favor at the author's hands, as he evidently regards that of Heitzmann as covering all of truth on this question.

In the consideration of the pulp the author adopts, in part, Arkövy's classification (*Diagnostik der Zahnkrankheiten*), though he expressly disagrees with him on some points. This chapter is interesting and instructive, and altogether worthy of the author, although some exceptions might be taken to his divisions, which seem unnecessary and tending to complications.

In the chapter on Pericementitis this tendency to minute pathological subdivisions is manifest to a very objectionable degree, as he divides the non-purulent under six heads,—1, Acute marginal pericementitis; 2, acute circumscribed pericementitis; 3, acute apical pericementitis; 4, acute diffuse pericementitis; 5, chronic hyperplastic partial pericementitis; 6, chronic hyperplastic diffuse pericementitis,—"Purulent". under six heads, and "Secondary Forms" under four, making sixteen divisions in all.

It is not possible to see any good or sufficient reason, beyond the multiplication of words, for this arrangement. The division between purulent and non-purulent is very questionable; for, in the reviewer's opinion, there can be no inflammation without emigration of leucocytes, and this means a purulent condition more or less extended as the inflammation progresses. The author seems to recognize this, for he says, "Doubtless the largest accumulation of the inflammatory elements takes place in the immediate neighborhood of the blood-vessels, for in the midst of many nests capillaries can be traced. . . . This fact has been taken up as an argument by those who assert that the inflammatory nests are altogether due to emigration."

Among the number of subdivisions is included pyorrhœa alveolaris, under the name of "Chronic Purulent Marginal Pericementitis."

The author antagonizes recent theories of the gouty diathesis, for he says, "It cannot be denied that a superabundance of uric acid in the system may assist in producing pyorrhœa alveolaris, but it will not exert more influence in this direction than consumption, anæmia, nephritis, hepatitis, diabetes, arthritis, syphilia, typhoid, chronic diseases of the nervous system, etc."

In the chapter on Caries the author concedes the truth of Miller's views, but qualifies it by stating that "I am convinced that only by a combination of both the inflammatory and the bacteriological doctrines the full truth will be reached."

In the chapter on Erosion the author slurs over as of no moment all theories excepting those which have had gout as a basis, for he writes, "Much was written on this subject *without advancing anything new* till E. T. Darby, . . . in 1892, stated erosion is mostly found in teeth of patients who suffer more or less from gout." He acknowledges that E. C. Kirk read a paper before the First District Dental Society in 1886 in which he demonstrated that its origin was from acid mucoid secretions of the mouth. He, however, gives priority to J. Truman.

This is certainly unjust to the writers named. The ideas they advanced were based on actual investigations, and were new at the time they were advanced, and were the first to give an intelligent reason for this pathological condition. The attention of the author is called to the Proceedings of the Odontological Society of Pennsylvania for January, 1884, and to note on page 242, April number, of the INTERNATIONAL DENTAL JOURNAL for 1893, for Dr. Truman's views. It is not necessary here to repeat them; suffice it to say there is a marked difference between these and Dr. Kirk's, though both are in accord. He will find that subsequently Dr. Brubaker confirmed Dr. Kirk's views, and demonstrated their correctness before the Odontological Society of Pennsylvania. The reader will be justified in the conclusion that the author has written this part in a partisan spirit. As this is manifested so frequently throughout the book, it becomes a question whether the aim has been to establish truth or to uphold certain ideas not generally recognized. While this is well in an argument, it seriously detracts from the value of a publication in which accuracy of statement is most important.

Great credit is due Dr. Bödecker for the careful attention given generally to this work, and it will certainly help, as he says in his



preface, to show "that scientific investigations are not neglected in our country," and beyond this it will be of great value as a work of reference to those who continue to devote time to histological work.

In a practical sense, as that is understood here, the book has but little value; in fact, it was not so intended. It contains no treatment of the pathological conditions described, hence its worth as a text-book in colleges cannot be rated very high, but in the library of the student, the thinker, and investigator it must have an important place, and, notwithstanding its many defects, will place the author in high rank among the best workers in his chosen field in this or any other country.

The very full "Literature" of the subjects treated is a valuable addition to the book, and shows much labor devoted to its preparation.

Great credit is due the S. S. White Dental Manufacturing Company for their part of the work. It is fully up to their high standard in every respect.

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## Foreign Correspondence.

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### LONDON LETTER.

TO THE EDITOR:

SIR,—From time to time there have appeared in the journals references to the recent action of the British Medical Council, whereby the register is, for the present, closed against degrees granted by Michigan and Harvard Universities. Judging by the tone of such references, there must be a considerable feeling of disappointment and indignation; indeed, some writers have worked themselves up to an inordinate degree of righteous wrath. My counsel to all such is, "Spare yourselves, it is only so much lost energy. Do not allow your indignation to run away with you."

The explanation of the recent action of the Medical Council is not far to seek. The great watch-cry of the Republican party yields the answer. Protection! Put yourself, gentle reader, in the place of our English cousins, and, especially if you be a good Republican, you must concur with the dental advisers of the Council. Might not the action of the Council, viewed in this light, be a compliment rather than a slight?

However, I do not write with a view to mollify those indignant spirits who feel their country slighted, but rather to comfort the disappointed ones. There are those who have looked forward to coming out here to practise,—it may be because a brother is already established on this side the Atlantic, or it may be because of a personal knowledge of the field existing here. To all such I would say, "Be of good cheer!" The recent fulminations of the British Medical Council are mere vaporings.

It was the great Irish lawyer, Daniel O'Connell, I believe, who said he could drive a "coach and six" through any act of the British Parliament. Well, in this case it does not even require the genius of an O'Connell. The fact is, the law is hardly worth the paper on which it is printed; any man wishing to practise in the British Isles may come out here and do so with perfect impunity. Let such a one put in addition to his name the name of the school from which he has graduated, and not only can the law not interfere, but no action of any kind whatsoever will be taken by the Medical Council.

The question was recently discussed in an amicable way by the members of a certain dental club here in London. Those who have read the report of the secretary of that club, as it appeared in the *Dental Review*, may remember the allegations of one member, "The Cynic." He charges reputable English dentists with indifference about advertising concerns because they are *publicly known as American*. He has even made the positive statement that it was his opinion that the institutions would long ago have been closed had there not been a tacit understanding among English dentists that it would be of very material advantage to them if the prestige of American dentistry in London could in some way be lowered.

I am not, Mr. Editor, one of the "Mystic Seven," neither do I know "Cynicus." I judge that he is one of those strong, self-reliant characters, intolerant of all sham and crookedness, imbued with a spirit of honesty and lofty aspirations, jealous of the good name of his profession, one the friendly grip of whose hands might well inspire new aspirations and new strivings after excellence. His opinion, no doubt, is based on the following facts: In the provinces the dental law is being enforced, and convictions have followed prosecution. In one case the words used on the sign of the establishment was "Dental Surgery." The offender set up the defence that the words referred not to him, but to the room, and that he had used no words to indicate that he was registered under

the act. The courts, however, held, and very properly, that the use of the words was a violation of the act, and convicted the offender. There have been other convictions of a similar character. Why, then, is no action taken in London? Cynicus has given his opinion, and, putting the above facts side by side, it seems justified. The case for Cynicus is still stronger. Among the advertising firms there is one which claims to be distinctively American. One of the leading *directors*, as they love to call themselves, is a man who failed to pass his examinations here, but who returned after a three months' visit to New York, and reported that he had received the D.D.S. while there, and so advertises himself now. Another director was till recently manager of a popular resort of amusement. In the branch over which he presides there is not a single American, and but one qualified man on the premises. The man who is practically manager failed a few years ago to get his degree in the schools here. Yet another director was till recently in a tailoring establishment. In passing, I may say there are many amusing stories told of the efforts of these two directors in interviewing new patients, arranging what work is to be done, and the fee to be paid.

Yet, Mr. Editor, this is an *American* establishment. These are facts known to the whole dental profession in London,—it is not an obscure firm doing business in a small way, but a firm with fine professional (God save the term) premises, sending out their advertisements broadcast. Why are not such charlatans closed up? Is Cynicus right after all? At times I have given a half assent to his proposition. I am convinced, however, that the true cause is deeper. Some time ago we who are registered received a notice from the Medical Council stating that if we permitted an unregistered or unqualified assistant to perform any work of a surgical nature we would be guilty of infamous conduct, and our names would be erased from the register. Now, in the case of the firm alluded to, three directors are "registered," one of the three is an L.D.S., the other two are on the register in virtue of having been in practice before the passing of the act. The remaining directors don't count, as previous to this venture they had no connection whatever with dentistry, one having been manager of a show and the other a tailor or tailor's assistant. Why, then, in the case of the three who are on the register, is not action taken in accordance with the notice which they, in common with the rest of us, must have received? Is it because there is no evidence forthcoming as to a breach of the law on their part? It cannot be so, since their advertisement distinctly

says that the patients are operated on by "skilled specialists from the United States," and then gives the names of these men, with the name of the college from which they have graduated. The Council have only to consult their register to find whether these men are legally qualified or not. I take it that in a court of justice it would rest with the advertisers to prove that the men whom they advertise as operators do not operate. But no, Mr. Editor, in the case of this so-called American firm no action is taken, although action based on the said notice has been taken in the case of professedly English dentists. Herein lies the secret of the safety of any American wishing to practise in the British Isles.

Sec. 3 (41 and 42 Vict., cap. xxxiii.) says, "From and after the first day of August, 1879, a person shall not be entitled to take or use the name or title of 'dentist,' . . . or any name, title, or addition, or description, *implying that he is registered under this act.*" The italics are mine. Any man who adds to his name the words "American," or "of Harvard," etc., is exempt, as he does not allege that he is on the British register, he rather wishes it to be understood that he is not, *and he is safe.*

Let me quote two cases in support of this, and which speak volumes. 1st. A dentist is practising not five minutes' walk from the offices of the General Medical Council. He is not on the register. *He* uses his title of "Dr.," and states on his plate at the street door in large letters that he is a D.M.D. of Harvard. Further, he sends out circulars, especially to big dry-goods and fancy warehouses, stating that he is an "ex-demonstrator of Harvard," and will extract teeth gratuitously for the employés if the principals in turn will recommend him to their customers. Here is a case of a man styling himself a dental surgeon, and practising as such within five minutes of the Council, and they cannot interfere with him. He states, however, that he is D.M.D. of Harvard.

Another case: An American doing a legitimate practice, acting and living as a professional man, putting on his name-plate simply the words "Mr. —," had a call one morning from two young men, whom he afterwards heard were clerks in the offices of the Council. They were so persistent in their desire to know if he was Mr. —, the dentist, even after he had assured them that if they required dental work he would be glad to examine their mouths, etc., that he finally replied, "No, I am Harry, the horse-thief," and politely ushered them out of the room.

The moral of these two cases is, if you boldly state where your qualification was gained the law cannot interfere. Finally, an

American stated to me that Sir Richard Quain, President of the Medical Council, told him that if he added to his name the words "of New York," no one would interfere with his practising.

I think, Mr. Editor, that I have given sufficient reasons and evidence to prove that any one who wishes can come here and practise without "let or hinderance."

Faithfully yours,

X.

LONDON, ENGLAND, October, 1894.

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## Current News.

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### WOMAN'S DENTAL ASSOCIATION OF THE UNITED STATES.

THE regular monthly meeting of the Woman's Dental Association of the United States was held October 6, 1894, at Dr. Focht's office, in the Bank Building, Broad and Columbia Avenue, Philadelphia, Dr. Anna T. Focht, President, in the chair.

Subject of the evening, "The Care of Patients," by Dr. Annie Felton Reynolds, of Boston.

In the absence of the essayist, the paper was read by Dr. Mary H. Stilwell.

The next meeting will be held at Dr. Maria T. Lasser's office, 1602 Arch Street, November 3, 1894.

EMILY W. WYETH,  
*Recording Secretary.*

8920 FAIRMOUNT AVENUE.

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### OHIO STATE DENTAL SOCIETY.

THE Ohio State Dental Society will hold its next annual meeting at Neil House, Columbus, Ohio, December 4 to 6, 1894.

J. R. CALLAHAN,  
*Chairman Executive Committee.*

## Selections.

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### CHEMICAL RESEARCHES ON THE MINERAL MATTER OF BONE AND TEETH.

DR. S. GABRIEL (*Ztschr. f. Physiol. Chem.*, xviii. p. 257) expresses the composition and properties of the ash of bone and teeth by the following general formula:  $\text{Ca}_3(\text{PO}_4)_2 + \text{Ca}_2\text{HP}_2\text{O}_7 + 2\text{H}_2\text{O}$ , in which from two to three per cent. of calcium is replaced by magnesium, potassium, and sodium, and from four to six per cent. of phosphoric acid is replaced by carbonic acid, chlorine, and fluorine. The quantity of chlorine amounts to only a few hundredths of one per cent., except in the enamel of the teeth, which contains a relatively larger quantity (0.21 per cent.). Fluorine is a constituent of both bone and teeth. The quantity does not usually exceed 0.05 per cent. of the ash, rarely amounting to 0.1 per cent. In direct contrast to the other solid tissues of the body, bone and teeth contain more sodium than potassium. While the quantities of calcium and phosphoric acid vary only inconsiderably, yet the magnesium and carbonic acid vary inversely with these, so that the sums of the two bases and of the two acids are constant. The distinctive character of the ash of particular bones depends on the variation in the amount of calcium and phosphoric acid replaced, and also on the nature of the replacing radicles. The difference that exists between bone-ash and tooth-ash is not greater than the difference which has been observed in the ash of different bones. In enamel there is less, and in the body of the tooth relatively more, calcium replaced by magnesium than in bone-ash.

As the formula indicates, the phosphate is basic in character and is probably a combination of a neutral and a basic phosphate. The relative valence of the acid and basic radicles is as 15 to 16. Water is present in two combinations,—water of crystallization, driven off at from 300° to 350° C., and water in chemical combination, driven off at white heat when the substance is mixed with silicic acid.—*New York Medical Journal*.

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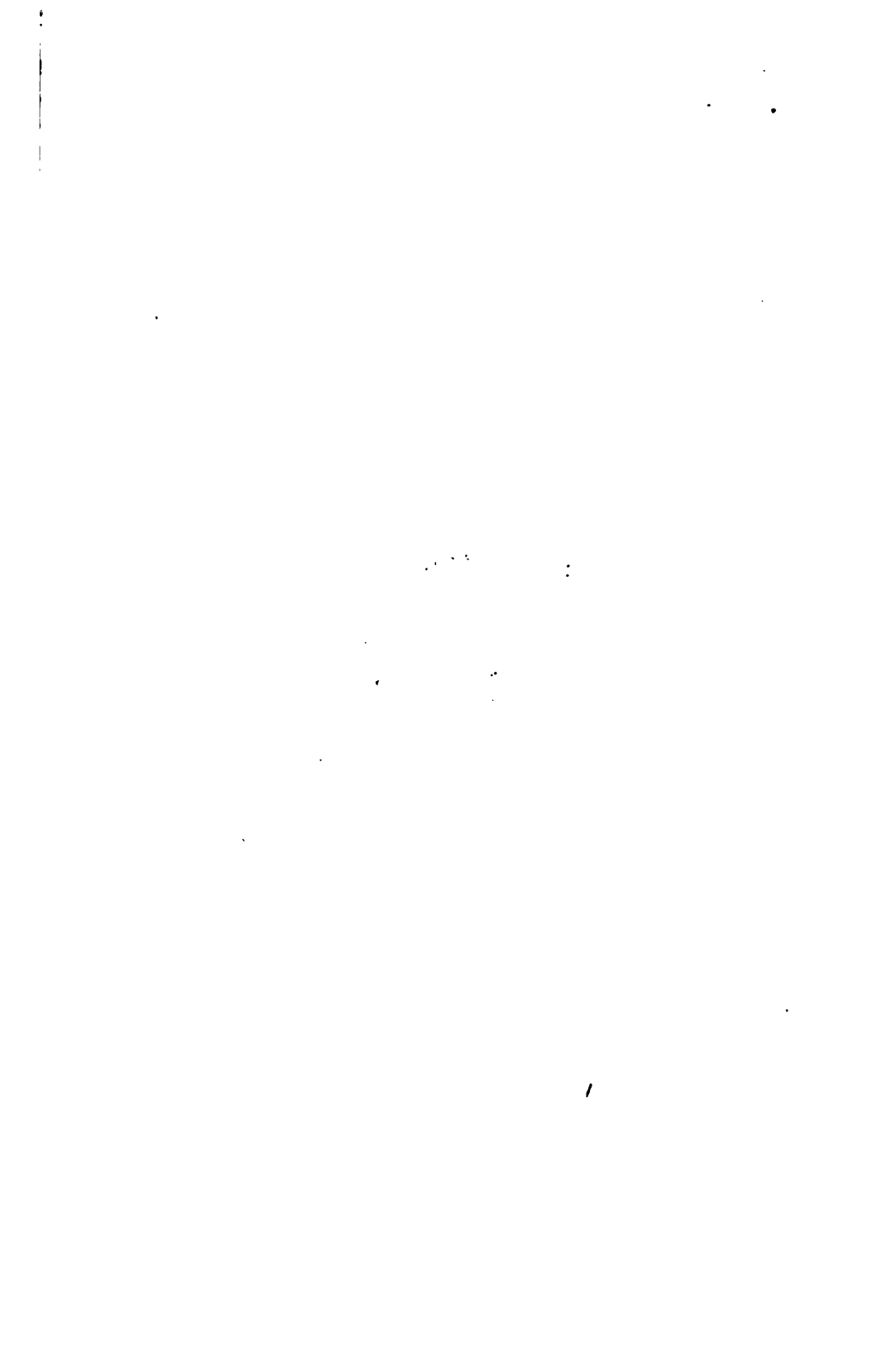
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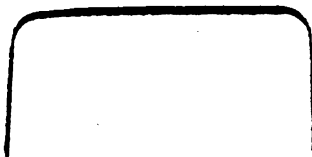








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